

**HEALTH-RELATED RESEARCH FACILITIES
IN THE UNITED STATES IN THE
NONPROFIT NONFEDERAL
SECTOR, 1968**

Report of a Survey

Conducted for

Department of Health, Education, and Welfare

National Institutes of Health

Health Research Facilities Branch

Under contract PH 43-68-947

April 15, 1969



WESTAT RESEARCH, INC.

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TABLE OF CONTENTS

	<u>Page</u>
Part 1: <u>Summary Report.</u>	1
1. 1. Executive abstract.	3
1. 2. Introduction	5
1. 3. Principal findings.	7
Part 2: <u>Detailed Analysis.</u>	15
2. 1. Survey response rate.	15
2. 2. Ownership and use of health-related research space.	17
2. 3. Age and condition of existing health-related research space.	19
2. 4. Current construction and remodeling program.	21
2. 5. Personnel in health-related research.	23
2. 6. Annual expenditures on health-related research.	25
2. 7. Health-related research space needs projected to 1980.	27
2. 8. Planning factors for remodeling.	29
2. 9. Space for care and housing of animals.	31
2. 10. Further analysis of educational components and of large institutions.	33
2. 11. Summary of selected survey data by state.	51
Part 3: <u>Methodology and tables.</u>	101
3. 1. Survey methodology.	101
3. 1. 1. Survey population.	101
3. 1. 2. Survey questionnaire.	105
3. 1. 3. Pretest of questionnaires.	106

TABLE OF CONTENTS (Continued)

	<u>Page</u>
3.1.4. Survey management.	108
3.1.5. Data handling.	112
3.1.6. Evaluation of survey results.	113
3.2. Supplementary tables.	115
3.3. Medical school comments to item 34 of the questionnaire.	139
Appendix	147

Part 1: Summary Report

1. 1. Executive abstract.

The National Institutes of Health contracted with Westat Research, Inc., of Bethesda, Maryland, in March 1968 to undertake a national survey of the facilities used for research in the sciences related to human health in all public nonfederal and private nonprofit institutions of higher education, hospitals, state and local departments of health and mental health and nonacademic research institutions. The survey sought information on the amount, age, condition and ownership of space presently used for health-related research, the amount under construction or firmly scheduled to be constructed, the amount of space needed to overcome overcrowding, the amount required by 1980, the personnel using the space, and the cost of the research activities taking place in the space.

The questionnaires were mailed to 1093 institutions about September 1, 1968. Although only 671 of the addressees submitted substantive responses, they accounted for 96.6% of all of the PHS research grants awarded to the addressees in Fiscal Year 1967. In effect, then, the respondents comprise essentially all of the nonprofit nonfederal facilities throughout the country where health-related research is conducted.

The respondents report using 41.5 million net square feet (nsf) of health-related (H-R) research space, of which 38.2 million is owned by the respondents, 2.1 million owned by other institutions (mainly hospitals affiliated with medical schools) and 1.2 million is rented. The academic sector used 82 percent of the space: medical schools, 42%; other health-professional schools, 8%; and other academic institutions, 32%. Of the

space owned by respondents, 9.5 million net square feet (about 25%) was built prior to 1940, 7.7 million (20%) was built between 1940 and 1957, and the balance, 20 million (55%) was built since 1957.*

The respondents report that 10.2 million net square feet (27%) of owned space currently in use is in unsatisfactory condition: 6.5 million should be remodeled, and 3.7 million should be replaced. The respondents also report they require 14.8 million net square feet of additional space to relieve overcrowding of current programs. Thus, about 25 million net square feet of new and remodeled space is needed to correct current deficiencies. The 8.6 million net square feet (nsf) of ongoing construction and 1.5 million nsf of ongoing remodeling, even if all applied to correct these deficiencies, would accomplish only about 40 percent of the task.

By 1980 (12 years from the reporting date) respondents estimate they will need 54 million nsf of new space (47 million in academic institutions) and 17 million nsf of remodeling in order to overcome the remaining deficiencies after completion of the current construction program and to allow for expansion and institution of new research programs.

* All data quoted in this report, unless otherwise specified, are aggregates for the responding institutions, with no upward adjustments to account for the institutions that did not respond to the applicable questions.

1. 2. Introduction.

For a number of years, the extramural grant programs of the National Institutes of Health have been the principal Federal source of financial support for the research and research training activities in the sciences related to health in the nonprofit institutions throughout the United States. In line with this broad responsibility to the national biomedical research community, NIH has, since 1957, administered the Health Research Facilities construction program authorized by Title VII A of the Public Health Service Act.

This program provides matching grants to nonprofit nonfederal institutions for the construction of facilities for conduct of research and research training in the sciences related to human health. Since the inception of the program, about \$470 million has been awarded to over 1150 projects for construction or remodeling of about 19 million net square feet (nsf) of space. These awards were made during a period when the NIH research and training grants grew from about \$100 million in 1957 to about \$800 million in 1967.

In the summer of 1967, it was evident that NIH needed authoritative information to plan the future of the Health Research Facilities (HRF) program. Data were needed on the amount of space in use for health-related research throughout the country, the age and condition of the space, the numbers and types of people using it, and the estimates of the institutions as to their needs for additional space today and by 1980.

Accordingly, a national survey of health research facilities was undertaken to obtain this information. An ad hoc advisory committee was established consisting of representatives from interested offices within NIH and the Office of the Secretary. A consultant with extensive survey research experience was added to the committee. The advisory committee reviewed the nature and objectives of the survey and was consulted on each subsequent phase of the project. The committee

recommended that a mail survey of the entire universe of relevant institutions be conducted by a professional survey research organization to be selected on a competitive basis. Westat Research, Inc. of Bethesda, Maryland was selected as the contractor. Between March 1968 and the summer of 1968 the questionnaire was developed and pre-tested. Clearance by the Bureau of the Budget was received by mid-summer and the questionnaires were mailed early in September 1968 to 1093 institutions which received 99.4% of the PHS research grants awarded in Fiscal Year 1967. Responses were requested by the third week in October, but in response to requests for more time, the deadline was extended to the end of December 1968. Vigorous follow-up efforts were made to insure that all major NIH grantees responded. These follow-up efforts resulted in receiving responses from 973 institutions or 89.0 percent of the 1093 institutions on the mailing list. These respondents accounted for 96.6 percent of the Public Health Service research grants awarded to the 1093 institutions in Fiscal Year 1967. For practical purposes, then, the survey responses can be viewed as coming essentially from all nonprofit nonfederal institutions in the country conducting research and research training in the sciences related to human health.

The report is organized in three parts. Part 1 summarizes the principal research findings. The reader who needs to know only the scope of the project and the principal findings may wish to read only this part. Part 2 provides a more complete discussion of the findings, particularly with respect to interrelationships among the reported data. Part 3 describes the survey methodology and provides additional tables of data for those who wish to study the results at greater depth. Reference to the questionnaires which appear in the Appendix should be helpful in understanding the definitions of reported data items, regardless of the depth of the reader's interest.

1. 3. Principal findings.

1. 3. 1. The health-related research space inventory.

Respondents to the survey can be classified into one of the following broad categories:

- Educational institutions
- Independent hospitals
- Nonacademic research institutions
- State and local departments of health and mental health
- Other institutions

The data for the educational institutions was subdivided into:

- Dental schools
- Medical schools, including hospitals owned by the medical school or the university
- Schools of pharmacy
- Schools of public health
- Schools of veterinary medicine
- Other academic institutions

The last category consists of aggregate health-related research facilities of all remaining educational components of colleges and universities such as departments of biochemistry, physiology and so on. Thus, the word "institution," as used in this report, sometimes means a large educational institution such as a university and sometimes refers to the specific reporting components of such institutions. The context makes the meaning clear. The separate major campuses of the state university systems of California, New York and Texas were considered to be separate educational institutions.

Respondents reported using 41.5 million nsf of health-related (H-R) research space, of which 38.2 million is owned by them,

1.2 million is rented, and 2.1 million is owned by nonrespondent institutions such as Federal and other hospitals. About 80 percent of the H-R research space is used by academic institutions, and about half of that by medical schools.

Of the 38.2 million nsf of H-R research space owned by respondents, 21.0 million nsf, or 55 percent was constructed since 1956. But 20 percent of space (7.7 million nsf) is between 12 and 28 years of age and 25 percent (9.5 million nsf) was constructed prior to 1940 and is over 28 years of age. Of the 21 million nsf of space built since the construction grants program began in 1957, 12.7 million nsf, or 60.5 percent was built with the assistance of Health Research Facilities construction grants.

About 27 percent of the 38.2 million nsf of health-related research space owned by reporting institutions was reported to be in unsatisfactory condition: 6.5 million nsf needs remodeling and 3.7 million nsf needs replacement.

It was also reported that 14.8 million nsf of additional space was needed to relieve overcrowding of current health-related research. The space needed to relieve overcrowding amounted to 37 percent of the inventory in medical schools, 60 percent in other health-professional schools, and 38 percent in other academic institutions.

Density of use of the research space can be measured in terms of nsf per professional researcher, or the dollars worth of research per net square foot, or the dollars worth of research per employee. The reported annual expenditures for H-R research, the number of employees, the space used and some significant ratios are shown in Table 1.1. The apparent high concentration of research in independent hospitals, as shown by \$51.50 per nsf of research space and \$31,800 per professional employee, is heavily influenced by the

Table 1.1. Reported annual expenditures, number of employees and space used for H-R research.

Kind of institution	H-R research space (Thousands nsf)	H-R research expendi- tures (Million dollars)	Number of employees in H-R research		Dollars per nsf	Thousand dollars per profes- sional employee	Dollars per professional and training employee	nsf per professional employee
			Profes- sional	Profes- sional and training*				
Medical schools	17,378	594	27,788	43,242	34.2	21.8	13.7	625
Other H-P schools**	3,245	72	4,751	9,716	22.2	16.1	7.4	683
Other academic institutions	13,460	290	14,540	40,899	21.5	21.1	7.1	926
Independent hospitals	2,390	123	4,084	5,734	51.1	31.8	21.4	583
Other institutions	5,002	190	6,764	8,538	38.0	33.1	22.3	738
Totals	41,475	1,269	57,927	108,129	30.6	22.7	11.7	716

* Graduate students, postdoctoral research fellows and trainees.

** Other health-professional schools include dental schools, schools of pharmacy, schools of public health and schools of veterinary medicine. The abbreviation H-P is used in subsequent tables.

amount of clinical research in hospitals, which utilizes little separately designated research space. The same is true of "other institutions" which are dominated by state hospitals.

The most significant data of Table 1.1 are contained in the last column which shows net square feet per professional employee. Throughout this report professional employees have been defined to be persons who have completed their formal research training and who are engaged at least part time in health-related research. Many of them are teaching, in private practice, or both. They do not include postdoctoral research fellows and trainees--these form a separate category (see Item 22 of the questionnaire in the Appendix).

Health-related research space includes that space set aside exclusively for health-related research plus an allocated portion of space jointly used by other activities. Health-related was interpreted broadly (see questionnaire). There was essentially no problem in determining whether research conducted in health-professional schools, hospitals, etc., was health related, but communication with respondents in other academic institutions revealed a substantial amount of subjectivity in determining whether some research was health related.

This subjectivity may be partly responsible for the variability in nsf per professional employee shown in the last column of Table 1.1. For example, medical schools reported 625 nsf per professional employee, other health-professional schools 683 nsf, while other academic institutions reported 926 nsf.

Further analysis of net square feet per employee, taking into account other users of research space, shows the following comparison between medical schools and other academic institutions:

	<u>Average net square feet per employee</u>	
	<u>Medical schools</u>	<u>Other academic institutions</u>
Professional employees only	625	926
Professional employees, graduate students and postdoctoral fellows	402	329

On the basis of these data, the amount by which one might adjust the reported research space in other academic institutions to an equivalent concentration of that reported for medical schools is uncertain. One such possible adjustment is the ratio of nsf per professional employee in medical schools (625) to the same measure in other academic institutions (926), yielding an adjustment factor of approximately two-thirds.

If this downward adjustment were applied to the 13.5 million nsf in other academic institutions, the total health-related research space used would be reduced some 4.4 million nsf, from 41.5 million nsf to 37.1. No such adjustment, however, has been made in any of the analyses which follow.

Respondents reported about 192 thousand people working at least part time in health-related research, of whom 58 thousand are professional staff, 12 thousand are postdoctoral fellows and trainees and about 38 thousand are graduate students. As noted above, many of the professional researchers also teach or are practicing physicians, or both. The overall density of use is about 200 nsf per person when the total staff is considered. Table 1.1 shows how the space allocation varies by type of institution for research personnel.

Total annual expenditures on health-related research were reported at 1.27 billion dollars. About 83 percent of this was sponsored research and the remainder was research supported by the institutions' separately budgeted research funds. About 47 percent of

health-related research expenditures are in medical schools, another 6 percent in other health-professional schools and 23 percent in other academic institutions for a total of 956 million, or about three-fourths, in all educational institutions.

At the date of reporting, about 8.6 million nsf of health-related research space was either under construction or fully funded for construction. This amounts to 16 percent of the owned space at that time. About 59 percent of this space was being funded with the assistance of Health Research Facilities construction grants. Another 1.5 million nsf was being remodeled and 32 percent of this remodeling was being funded with the assistance of Health Research Facilities construction grants. The planned use of the new space being constructed and remodeled was not reported, but if it were all allocated to relief of overcrowding it would be only about half enough to satisfy those needs. Space for the care and housing of animals used in research accounts for about 4.7 million nsf, or 11 percent of total health-related research space. About 39 percent of the space for animals was constructed with the assistance of Health Research Facilities construction grants. About 1.1 million nsf of animal space was being constructed or was fully funded and another 0.2 million nsf was being remodeled. The participation of the Health Facilities Construction Branch in the ongoing new construction and remodeling program was not sought by the survey.

The total space built since 1956 is about 122 percent of the space built prior to that time. It is recognized that there may have been space used for health-related research in 1956 which was diverted to other uses or replaced by new construction since that time, but, as a rough approximation, one can equate space built before 1957 with the inventory at that time. If so, the growth rate of H-R space in the approximately 11 years that the Health Research Facilities construction program has been in effect is about 7.5 percent per year compounded annually. It is interesting to note that the amount of space under

construction or fully funded is about 22 percent of the inventory. Considering the normal elapsed time between funding and completion this amount corresponds reasonably well to the established growth rate, that is, it is over two years of growth. The requirements of space to relieve overcrowding, on the other hand, amount to about a four year backlog.

The institutions which sometime since 1956 have participated in Health Research Facilities construction grants account for 87 percent of the total owned space at the time of reporting. This breadth of coverage of the assistance program is so great that it has defeated attempts to compare the characteristics of institutions which received such assistance with those which did not. For example, 99 of the 100 largest academic institutions (in terms of PHS grants) had received facilities construction grants, and the one which did not ranked 97th in size. Thus, one generalization which is readily apparent is that the nonparticipating institutions tend to be the smaller institutions. There is wide variability among the nonparticipating institutions, however, and this variability makes generalization about the comparison between recipients and nonrecipients hazardous.

1.3.2. Projections of research space needs—1980.

Responding institutions were asked to project their health-related research space needs to 1980. Construction needs were reported by 663 of the 671 institutions and amounted to 54.5 million nsf of new construction. Another 17.3 million nsf of needed remodeling was reported by 506 institutions. If one can assume that the 14.8 million nsf of health-related research space needed to relieve overcrowding will be supplied out of the 1980 new construction projections of 54.5 million nsf, and that the 3.7 million nsf needing replacement will also be taken care of by 1980, then the difference of 36.0 million nsf will represent an amount available for expansion of health-related research programs or

implementation of new programs. It is likely, however, that some of the remodeling will also represent net additions to such space.

The projected rate of growth of new space (making the same assumptions as before about replacement) for the 12 years from 1968 to 1980 is again about 7-1/2 percent per year compounded annually, constituting a projection of the same rate of growth evidenced over the past 11 years. Since, presumably, the reported needs include correction of the present need for space to relieve overcrowding (about a four year backlog at present) the rate of growth is substantially less than 7-1/2 percent, being more nearly 6-1/2 percent.

About 11.6 percent of the projected needs for new construction are for space for the care and housing of animals, which compares closely with the 11.3 percent of space in the current inventory which is used for that purpose.

Respondents were invited to report how the planned new construction and remodeling was to be used. Almost 300 institutions indicated that about 48 percent of new construction would be used for existing research programs and the same percentage for new research programs. It was estimated that 52 percent of remodeling would be used in existing programs and 34 percent in new programs. Other reported uses accounted for small amounts of space.

Questions were asked concerning expected funding of new construction and remodeling to 1980. Respondents estimated the total construction and remodeling bill at \$4.0 billion at 1968 prices, or an average annual requirement of \$333 million. If one estimates an average two year lag between funding and completion, then about \$400 million per year is needed to 1978. Any estimate must, of course, be adjusted by an inflation factor. Respondents indicated their belief that 42 percent of the cost of new construction could be obtained from non-federal sources and 38 percent of the remodeling costs.

This distribution differs from the sources of funding for ongoing construction and remodeling which are shown below:

Institutions' unrestricted funds	9.3%
Institutional borrowing	2.1%
Private funds for construction and remodeling	9.1%
Construction funds from state and local governments	47.1%
Federal sources	31.2%
Other sources	1.2%
	<hr/>
	100.0%

Since 69 percent of current construction and remodeling funds are from nonfederal sources, it is clear that reporting institutions expect much greater difficulty in obtaining funds from nonfederal sources between now and 1980 than at present. Over half of the institutions reported that they could obtain no more than 47 percent of construction funds from nonfederal sources and no more than 50 percent of remodeling funds.

The percentage distribution, above, showing that 31 percent of current funding comes from Federal sources must, of course, be interpreted as Federal support of 62 percent of the total construction and remodeling program under a 50-50 matching arrangement.

Part 2: Detailed Analysis

2.1. Survey response rate.

The mailing list (see Part 3) contained names and addresses of 1093 institutions, most of which received PHS grants in FY 1967. Not all were expected to report H-R research space, and survey results verified that some did not have such space. In general, an entire university was considered to be a single institution, except for the state university systems of California, New York and Texas, in which each major campus was considered to be a separate institution. Also, each state or local department of health or mental health was considered to be a single institution, even though it might have contained several reporting components such as state hospitals. Reporting components of academic institutions were separately identified by the various kinds of health-professional schools and the remainder of the university.

Table 2.1.1.* shows that 400 of the 1093 institutions on the mailing list were academic institutions and that they had 646 known components as defined above. Each institution was asked to submit a preliminary Part A response which identified the specific components to be reported and the persons responsible for preparing the substantive Part B responses to be submitted later. A total of 263 of the 400 academic institutions responded and submitted 470 out of 648 possible component responses. Thus, the larger, more complex institutions tended to respond better than the smaller, single component, academic institutions.

* All tables, except small tables interspersed throughout the text, have been placed at the end of Part 2.

This differential response rate is further emphasized by Table 2.1.2. which indicates the significance of the reporting institutions in terms of Public Health Service grants for research. Institutions on the mailing list received \$699 million of PHS grants in FY 1967, and institutions responding to the survey accounted for 96.6 percent or \$675 million of the \$699 million grant monies awarded. Among academic institutions, reporting institutions accounted for 98.9 percent of grant monies. Thus, while the overall response rate was only 671 out of 1093 institutions, the reporting institutions accounted for 96.6 percent of Public Health Service grants, indicating that nonrespondents are relatively small with respect to the universe of nonprofit nonfederal health-research institutions.

The composition of the reporting academic components is shown in Table 2.1.3. Two hundred forty-three out of 261, or 93 percent of health-professional components respondents reported and, as observed above, these tended to be components in institutions receiving the most Public Health Service grants.

2.2. Ownership and use of health-related research space.

Institutions responding to the survey reported owning 38.2 million net square feet (nsf) of health-related research space, of which 1.7 million nsf is used by other institutions (for example, space owned by reporting hospitals but used by medical schools). Table 2.2.1. shows that 36 percent of the 38.2 million nsf is owned by medical schools and 35 percent by components of academic institutions other than health-professional components. Health-professional schools other than medical schools reported owning eight percent and independent hospitals nine percent.

In addition to the 38.2 million nsf owned by respondents, another 1.2 million is rented and 2.1 million is owned by nonrespondents, making a total of 41.5 million nsf in use by the respondents. The details are shown in Table 2.2.2. The 2.1 million nsf used by reporting institutions but owned by nonreporting institutions (Table 2.2.2.) largely comes from two sources: (1) The space owned by Federal hospitals (not in the survey) but used by medical schools, and (2) the space owned by other hospitals not included in the survey or not reporting but used by medical schools. The details for medical schools only are shown in Table 2.2.3.

Comparison of the last columns of Tables 2.2.1. and 2.2.2. shows clearly that independent hospitals provide a major portion of their research space to medical schools. That is, they own 9.0 percent of the total owned space, but use 5.8 percent, while medical schools own 36.1 percent and use 41.9 percent. The interrelationships of ownership and use are shown in Table 2.2.4. Over 80 percent of interinstitutional use is by medical schools, and about three-fourths of that space is provided by independent hospitals.

2.3. Age and condition of existing health-related research space.

Table 2.3.1. shows that about one-fourth of the H-R research space owned by reporting institutions was built before 1940, another fifth was built in the period 1940 to 1956, inclusive, and 55 percent was built since that time. The year 1957 is significant since it marks the beginning of the Health Research Facility grants program.

The age distribution of H-R research space owned by institutions who were recipients of Health Research Facilities construction grants is shown in Table 2.3.2. There is not much difference in the percentage distributions between Tables 2.3.1. and 2.3.2. because 87 percent of all reported owned space was owned by institutions who had received Health Research Facilities construction grants.

Table 2.3.3. shows the age distribution of space owned by reporting institutions who had not received Health Research Facilities grants.

Table 2.3.4. shows that just under three-fourths of all H-R research space owned by reporting institutions was in satisfactory condition while 27 percent was not: 17 percent needed remodeling and 10 percent needed replacing. Table 2.3.5. shows essentially the same percentage distributions for institutions which had received Health Research Facilities construction grants. The condition of H-R research space owned by institutions not receiving Health Research Facilities construction grants is shown in Table 2.3.6. A slightly higher percentage of space was reported as in need of replacement, but the total amounts are relatively small.

The relationship of age of space to reported condition is shown in Table 2.3.7. About 59 percent of the space constructed prior to 1940 was unsatisfactory, needing remodeling or outright replacement. About 36 percent of the space constructed between 1940 and 1956,

inclusive, was unsatisfactory and only 9 percent of the space built since 1956 needed replacement or remodeling. The difference in age-condition distributions between institutions receiving Health Research Facilities construction grants and those that did not is shown by a comparison of Tables 2.3.8. and 2.3.9. There appears to be greater need for replacement of older space in institutions which did not receive construction grants, but, of course, the total amount of such space is small.

The contribution of the Health Research Facilities grants program to the inventory of H-R research space is shown by Table 2.3.10. Over 60 percent of space reported built since 1956 was built with the assistance of Health Research Facilities construction grants. Seventy-nine percent of H-R research space in medical schools was reported built with construction grant assistance, and 65 percent of H-R research space in independent hospitals, much of which is used to support medical school programs.

The impact of the Health Research Facilities construction grants program on remodeling is shown in Table 2.3.11. Almost one-fourth of the space remodeled since 1956 received such grant assistance. Again, the highest percentage of assistance is shown for medical schools and independent hospitals.

2.4. Current construction and remodeling program.

As of the date of the survey (approximately the third quarter of calendar year 1968), 8.6 million nsf of H-R research space were under construction or fully funded for construction. Table 2.4.1. shows that this amounted to over one-fifth of the total existing inventory of H-R research space, indicating the need and dynamics of H-R research. The relative expansion was greatest (26 percent) in independent hospitals, next largest in medical schools (23 percent), and smallest in institutions other than academic components (9.6 percent). Much of the H-R research space owned by independent hospitals is used by medical schools (see Table 2.2.4.) so the expansion in space for independent hospitals is a reflection of the growth in medical schools.

About 45 percent of the space under construction or fully funded is receiving funds from the Health Research Facilities (HRF) construction program, as shown in Table 2.4.2. About 65 percent of the new space in health-professional schools and independent hospitals is receiving such support, 12 percent in other academic institutions and 17 percent in all other institutions.

Table 2.4.3. shows that 1.5 million nsf of H-R research space was being remodeled or was fully funded for remodeling as of the date of the survey. This amounted to 3.7 percent of the total H-R research space inventory. About one-third of current remodeling is being funded by Health Research Facilities grants (Table 2.4.4.) and this support is most heavily concentrated in medical schools and the independent hospitals which support them.

The sources of funds for the construction and remodeling programs currently underway or fully funded are shown in Table 2.4.5. About one-third comes from Federal sources. Such sources account for about 39 percent of funds for medical schools and 38

percent of funds for other health-professional schools. Institutional and private funds are important sources for independent hospitals and medical schools, while state and local governments are important to all academic institutions. The largest supporters of H-R research space construction are the state and local governments with 47 percent. The next largest is the Federal Government with 31 percent. But, it should be noted that, although the Federal share is only 31 percent, it participates in almost two-thirds of all construction under its 50-50 matching program.

2.5. Personnel in health-related research.

Respondent institutions reported 192 thousand personnel engaged in H-R research, of whom 58 thousand are professional and 50 thousand are postdoctoral research fellows and trainees and graduate students. Medical and other health-professional schools employ about 100 thousand, or 52 percent of the total. The second column of Table 2.5.1. shows the average reported nsf per professional employee. It should be noted that professional personnel are defined as those devoting at least part of their time to H-R research. Their full-time equivalence is unknown, and may have less significance for space planning than for some other planning activities since laboratory space and apparatus frequently cannot be shared, even though the research is part-time. Full-time professional personnel in academic institutions teach and conduct research. Part-time professionals are generally practicing physicians, with teaching affiliations in medical schools, who also conduct research. Medical schools reported 625 nsf per professional employee, other health-professional schools 683 nsf, and other academic institutions 926 nsf.*

Respondents were asked to report the nsf of H-R research space needed to relieve overcrowding of existing research programs. A summary is shown in Table 2.5.2. If one adds the H-R research space needed to relieve overcrowding (Table 2.5.2.) to the space presently used (Table 2.2.2.) and divides by total staff reported in Table 2.5.1. he obtains the following average nsf per person:

* See section 1.3.1. for a discussion of the disparity among these averages.

	nsf per professional only	nsf per aggregate of professional, postdoctoral and graduate students
Medical schools	833	536
Other health-professional schools	1,054	515
Other academic institutions	1,252	445

The computations are approximate, since not all institutions reported needs to relieve overcrowding, but they indicate the institutions' perceived needs of what they consider to be adequate space per person for H-R research.

2.6. Annual expenditures on health-related research.

Respondents reported 1.3 billion dollars of sponsored and other separately budgeted research. About 83 percent of this amount was sponsored research. The distribution by kind of institution is shown in Table 2.6.1. Almost half of the total expenditures were reported by medical schools. Other academic institutions accounted for about another fourth.

It was not possible to define a specific twelve month period for which expenditures were to be reported without imposing an undue reporting burden on the respondents. Each respondent was asked to state the year to which the reported data referred. Reported periods were the most recently completed fiscal year, the most recently completed fiscal year for which data had been summarized, or the "current" year (in which case the reported figures were largely budgeted figures rather than expenditures). Thus, there is some risk in trying to compare the total 1.3 billion dollars against expenditures or grants for any specific year.

Keeping this caution in mind, the last column of Table 2.6.1. shows the aggregate Public Health Service grants to respondent institutions for fiscal year 1967. These grants amount to 53 percent of the total reported annual expenditures, ranging from 55 percent for academic institutions to 45 percent for the all other category. While there is considerable uncertainty concerning the precision of this comparison, the order of magnitude is significant. Total Public Health Service support of research rose from \$803 million in 1967 to \$873 in 1968 or an 8.7 percent increase. Thus, the \$675 million PHS grants shown in Table 2.6.1. might be adjusted upward to \$734 million, or 58 percent of total sponsored and separately budgeted health-related research.

Table 2.6.2. shows average reported expenditures per nsf of health-related research space to be about \$31. Reported expenditures

also amounted to about \$22.7 thousand per professional employee. The comparisons among the kinds of institutions are interesting. Medical schools show essentially the same amount of expenditures per professional employee (around \$21,000). However, expenditures per nsf are approximately 60 percent greater for medical schools than for other academic institutions. Whether these figures are a reflection of a greater spatial density for medical schools or a more expensive kind of research is unknown. It should be noted in Section 2.5. that professional research personnel in medical schools use less nsf of health-related research space than do professional personnel in other academic institutions. This difference largely disappears, however, when one also considers the number of fellows and graduate students who share such space.

The high expenditures per nsf of health-related research space and the high expenditures per professional employee for independent hospitals (see Table 2.6.2.) may be a reflection of the large amount of clinical research conducted in such institutions.

2.7. Health-related research space needs projected to 1980.

Respondents were asked to project their needs for new construction and remodeling to 1980 over and above the new construction and remodeling currently underway. Responses are summarized in Table 2.7.1. New construction needs equal to nearly one and one half times the current inventory were reported by 663 reporting components. Remodeling needs equal to almost half the current inventory were also reported by 506 reporting components.

The amount of new construction needed to 1980 to replace existing space is unknown, but the following computations may provide a rough measure of the projected net increase in health-related research space:

Projected new construction to 1980 (Table 2.7.1.)	54.5 million nsf
Less space which should be replaced (Table 2.3.4.)	3.7 million nsf
Net addition to owned space	50.8 million nsf

This is approximately one and one-third times the present space inventory. It compares reasonably well with the 122 percent increase in the period 1957 through the reporting date which can be inferred from Table 2.3.1. Note, however, that 14.8 million is needed to relieve current overcrowding, so something like 36 million nsf might be considered available for expansion of existing research programs and implementation of new ones.

Respondents were invited to report plans for use of the new construction and remodeling needed to 1980. The responses are summarized in Tables 2.7.2. and 2.7.3. Planned use was reported for 32 million nsf of planned space, or almost 60 percent of the total planned needs. Planned use was almost equally divided between expansion of existing programs and institution of new programs.

Planned use of remodeling needs was reported for 7.6 million nsf out of a total reported need for 17.3 million nsf, or for 44 percent. Slightly over half of this remodeling was reported needed for existing programs, about a third for new programs, and about 14 percent for other uses.

Respondents were also asked to estimate the total cost for new construction and remodeling projected to 1980, at 1968 costs, and the amount of such cost which they felt they could obtain from nonfederal sources. The results are shown in Table 2.7.4. The total construction bill at 1968 costs is \$3.4 billion and the remodeling bill is \$573 million. It was estimated that about 42 percent of the cost of construction could be obtained from nonfederal sources and about 38 percent of the remodeling cost.

Respondents were also asked to list the institutional programs which would be most seriously affected if the additional construction and remodeling were not done. The replies are reported in full in Part 3, but are not summarized here.

2. 8. Planning factors for remodeling.

The substantial increase in health-related research space since 1956 and the projected further increase by 1980 make it necessary to plan for increases in the amount of remodeling. Respondents were asked for their best judgment as to the percentage of health-related space that needs to be remodeled per year in order to maintain its effectiveness. The responses are summarized in Table 2. 8. 1. There is obviously wide variation in opinion, but the frequency distributions among the various kinds of institutions are remarkably consistent.

Averages of the responses, by kind of institution are:

Medical schools	10. 7%
Other health-professional schools	11. 2%
Other academic institutions	12. 3%
All other institutions	10. 2%
Overall average	11. 2%

These estimates can be compared against the reporting of space actually remodeled since 1956. Table 2. 3. 11. shows that 8. 1 million nsf were remodeled in that period (roughly eleven years) or about 0. 74 million nsf per year. If one considers that there were about 17. 2 million nsf of space in the inventory at the beginning of that period* (Table 2. 3. 1.) this amounts to about 47 percent for the 11 year period, or slightly over four percent per year. Note that this figure compares favorably with the projections through 1980 of just under four percent per year of the present inventory.

Differences between these figures and those of table 2. 8. 1. may be due partly to different interpretations of the definitions by the

* The space now used for health-related research and built prior to 1957 is not equivalent to health-related research space on hand in 1957, but the approximation should be useful for comparison purposes.

respondents. Also, it should be remembered, Table 2.3.4 shows that 6.5 million nsf of space needed remodeling as of the date of reporting. If that amount is considered to be a backlog which should be added to the 8.1 million nsf remodeled since 1956 the total perceived by respondents as needing remodeling during the 11 year period is 14.6 million nsf, or about 7.7 percent per year. The smaller requirements for remodeling per year through 1980 could also be a reflection of the changing age composition of health-related research space, due to the rapid expansion in such space since 1956.

In any case, the various estimates constructed from the reported data vary from around four percent per year to eleven percent per year. A more refined estimate cannot be made from the data.

2.9. Space for care and housing of animals.

Several questions were asked to determine the relationship of space used for the care and housing of animals to total health-related research space. Some of the basic data are summarized in Table 2.9.1. About 4.7 million nsf, or 11.3 percent of the total space reported used in health-related research, was used in the care and housing of animals. About 42 percent of animal space was reported to be in medical schools, 50 percent in all health-professional schools, and 32 percent in other academic institutions.

About 39 percent of the reported animal space was built or remodeled with Health Research Facilities construction grant assistance, but nearly half of that in medical schools received such assistance.

Table 2.9.2. shows that 13 percent of the health-related research space being built or fully funded at the time of reporting was space for the care and housing of animals. Since only 11 percent of the inventory was animal space, one can conclude that the proportion of space used for animals will increase as a result of the current construction program. The increases are only in the academic sector which, as shown in Table 2.9.1., already contains 82 percent of such space. The increase is most pronounced in the non-health professional category, and Table 2.9.1. shows that the Health Research Facilities program is giving the lowest percentage support to these academic components.

Table 2.9.3. shows the amount of animal space in the current remodeling program. Overall, the amount being remodeled is roughly proportional to the amount of animal space in the inventory, but there is substantial variability among the kinds of institutions because the total amount of space being remodeled is small.

Table 2.9.4. shows that 11.6 percent of the projected needs for new construction to 1980 is for care and housing of animals. The percentages, by kind of institution, are remarkably similar to percentages

in the current inventory. One cannot infer from these data any major shift in perceived need for such facilities in the next decade. Needs for remodeling of animal space are percentagewise somewhat smaller than their relative proportions in the total inventory. The relevant percentages are given below:

Kind of institution	<u>Percent animal space of total H-R research space</u>				<u>Projections to 1980</u>
	<u>In the inventory</u>	<u>In the current construction program</u>		<u>New construction</u>	
				<u>Remodeling</u>	
Medical schools	10.4		14.3	10.9	8.5
Other health-professional schools	16.4		19.7	17.8	10.5
Other academic institutions	9.2		10.2	9.7	7.2
Independent hospitals	17.3		13.9	11.4	5.1
All other institutions	<u>13.6</u>		<u>10.0</u>	<u>16.3</u>	<u>7.4</u>
Totals	11.3		13.1	11.6	7.9

2. 10. Further analysis of educational components and of large institutions.

There were 85 fully-accredited four-year medical schools in the United States at the time of the survey and 84 of them responded. It was decided that, for analytical purposes, the remaining 16 medical school respondents (two-year medical schools and newly organized four-year medical schools) would be categorized as other health-professional schools. Thus, for special analytical purposes, the academic institutions have been classified as follows:

84 Medical schools

148 Other health-professional schools

224 Other academic institutions

Also, for special analytical purposes, the 100 largest academic institutions in terms of total dollars of Public Health Service grants in FY 1967 were considered separately, regardless of their organizational structure. That is, for these purposes, an institution generally included an entire university, including any medical, dental or other schools it may have contained. However, the principal campuses of state universities in California, New York and Texas were categorized as separate universities. These three state university systems accounted for 13 of the 100 largest academic institutions in terms of Public Health Service grants.

Collectively, the 100 largest institutions accounted for \$499 million out of \$699 million worth of 1967 Public Health Service grants, or 71 percent. Their significance can also be shown by the number of components they contain, as follows:

	Number responding	Number in 100 largest academic institutions
Fully accredited four-year medical schools	84	75
Other medical schools	16	6
Dental schools	50	43
Schools of pharmacy	63	37
Schools of public health	13	12
Schools of veterinary medicine	17	12

The analysis in this section proceeds with the examination of relationships among the reported variables which reveal both differences and variability in the ownership, condition and utilization of space and the planning for future space requirements. A number of ratios were computed for each of the reporting institutions, such as percent of space built since 1956, percent in satisfactory condition, expenditures per employee, and so on. Within each of the four classes of institutions (medical schools, other health-professional schools, other academic institutions, and the 100 largest academic institutions) these ratios were put in order from lowest to highest and then divided into four equal groups so as to identify quartile points. The first quartile point is then the value such that one-fourth of the institutions have a lower ratio, the median is the value such that one-half of the institutions have a lower ratio, and so on. A measure of the spread or scatter of the ratios is provided by the distance between the first quartile point and the third quartile point, since one-half of the ratios lie within this interquartile range.

Table 2.10.1. shows the relative "growth" of the various types of institutions since 1956. An example of the interpretation of the data within the columns is as follows: One-fourth (i. e., 21) of the reporting 84 fully-accredited medical schools built 38.8 percent or less of their health-related research space since 1956; one-half (42) built 61.3 percent or less since 1956; and, three-fourths (63) built 79 percent or less since 1956. In the case of other health-professional schools, the zero value for the first quartile point indicates that at least one-fourth of the reporting schools built no new health-related research space since 1956. The 100 percent value of the third quartile point for the same group indicates that at least one-fourth of the reporting institutions built all of their health-related research space since 1956. This group of schools, of course, is known to be heterogeneous, so the result is not unexpected.

In all cases, the identified fractions (one-fourth, one-half, three-fourths) apply to the number of institutions reporting sufficient data to make the determination. These numbers are not constant from ratio to ratio, but are shown at the top of each column.

Table 2.10.1. Medians and quartile points of selected ratios: Percent of health-related research space built since 1956.

Statistic	84 accredited medical schools	146 Other health-professional schools	222 Other academic institutions	100 largest academic institutions
First quartile point	38.8%	0.0%	30.6%	42.6%
Median	61.3	57.3	59.1	50.8
Third quartile point	79.0	100.0	90.6	71.4

Table 2.10.2 shows quartiles and medians for percent of health-related research space in satisfactory condition. At least one-fourth of other health-professional schools and other academic institutions reported all space in satisfactory condition. There is substantial consistency in the distributions across the four categories of interest.

Table 2.10.2. Medians and quartile points of selected ratios: Percent of space in satisfactory condition.

Statistic	83 of 84 accredited medical schools	148 Other health- professional schools	224 Other academic institutions	100 largest academic institutions
First quartile point	56.4%	42.3%	54.4%	61.8%
Median	79.2	83.2	77.0	76.2
Third quartile point	94.1	100.0	100.0	87.5

Table 2.10.3. shows wide variability in the distribution of the percent of health-related research space built since 1956 with the assistance of Health Research Facilities construction grants. Fifty percent of medical schools received such support for 86.2 or more percent of their health-related research construction space, compared to 34.1 percent of construction for other health-professional schools and only 10.0 percent of construction for other academic institutions. The heavy influence of the large health-professional schools is shown in the data for the 100 largest institutions.

Table 2.10.3. Medians and quartile points of selected ratios: Percent of space built since 1956 with the assistance of Health Research Facilities construction grants.

Statistic	83 of 84 accredited medical schools	106 Other health- professional schools	197 Other academic institutions	99 of 100 largest academic institutions
First quartile point	60.0%	0.0%	0.0%	49.3%
Median	86.2	34.1	10.0	70.8
Third quartile point	100.0	100.0	74.3	91.0

One can consider the ratio of nsf of H-R research space needed to relieve overcrowding to nsf of H-R research space in the inventory as an index of overcrowding. Table 2.10.4. shows the distributions by kinds of institutions. One-fourth of other health-professional schools reported essentially 100 percent overcrowding. One-fourth of all classes of institutions reported at least 54 percent overcrowding, and one-fourth reported no more than 20 percent overcrowding.

Table 2.10.4. Medians and quartile points of selected ratios: Percent of additional H-R research space needed to relieve overcrowding

Statistic	76 of 84 accredited medical schools	141 Other health- professional schools	207 Other academic institutions	96 of 100 largest academic institutions
First quartile point	13.2%	13.7%	13.7%	19.9%
Median	29.7	40.0	33.4	30.0
Third quartile point	59.8	99.9	69.1	54.3

Another way of looking at overcrowding is in terms of nsf per professional employee. Table 2.10.5. shows substantial consistency among the principal categories of reporting institutions.

Table 2.10.5. Medians and quartile points of selected ratios: Reported nsf of overcrowding per professional employee.

Statistic	75 of 84 accredited medical schools	142 Other health- professional schools	206 Other academic institutions	95 of 100 largest academic institutions
nsf per professional employee				
First quartile point	87	62	94	136
Median	190	227	274	230
Third quartile point	346	572	503	425

The perceived requirements per professional employee are shown in Table 2.10.6. Here, the existing used space was added to the space needed to relieve overcrowding and divided by number of professional employees. Here, as in Table 2.10.5., the reporting of more space needs per employee in other academic institutions can be noted.

Table 2.10.6. Medians and quartile points of selected ratios:
Reported nsf used and needed to relieve over-crowding per professional employee.

Statistic	82 of 84 accredited medical schools	154 Other health- professional schools	223 Other academic institutions	99 of 100 largest academic institutions
nsf per professional employee				
First quartile point	585	493	750	703
Median	879	815	1148	994
Third quartile point	1141	1308	1558	1401

Two other ratios of interest which reflect concentration of research are expenditures per professional employee and expenditures per nsf of health-related research space used. The medians and quartiles are shown in Tables 2.10.7. and 2.10.8. There is substantial

Table 2.10.7. Medians and quartile points of selected ratios: Health-related research expenditures per professional employee.

Statistic	81 of 84 accredited medical schools	151 Other health- professional schools	218 Other academic institutions	99 of 100 largest academic institutions
Thousands of dollars				
First quartile point	14.6	4.3	7.1	15.2
Median	22.9	10.1	14.2	22.0
Third quartile point	30.1	17.7	21.9	29.5

Table 2.10.8. Medians and quartile points of selected ratios: Health-related research expenditures per nsf of health-related research space used.

Statistic	83 of 84 accredited medical schools	150 Other health- professional schools	219 Other academic institutions	100 largest academic institutions
Dollars per nsf				
First quartile point	25.4	8.2	9.8	19.4
Median	33.3	18.3	17.3	28.6
Third quartile point	45.4	35.2	28.6	38.1

variation both within the studied classes of institutions and across such classes. For example, within the accredited medical schools, one-fourth are funded with less than \$15 thousand of research money per professional employee and one-fourth have \$30 thousand or more. One-fourth spend less than \$26 per nsf of research space on funded research and one-fourth spend over \$45. Other health-professional schools and other academic institutions show even wider divergence.

Expenditures per professional employee are positively correlated with expenditures per nsf of health-related research space. That is, educational components or institutions having small research budgets per professional employee also tend to have small research expenditures per net square foot of research space. The cross tabulation of number of medical schools above and below the median is shown below:

	<u>Number of medical schools with expenditures per net square foot:</u>	
	<u>Below \$33.30</u>	<u>\$33.30 or above</u>
Expenditures per professional employee:		
Below \$22.9 thousand	26	14
\$22.9 thousand or above	15	26

The same relationship holds for other health-professional schools, other academic institutions and for the 100 largest academic institutions. It is most pronounced in the case of other academic institutions.

	<u>Number of other academic institutions with expenditures per net square foot:</u>	
	<u>Below \$17.30</u>	<u>\$17.30 or above</u>
Expenditures per professional employee:		
Below \$22.0 thousand	87	23
\$22.0 thousand or above	23	86

The above relationship is only partly accounted for by the amount of research space available per professional employee. The negative correlation between nsf per professional employee and research expenditures per nsf is shown below for medical schools.

	<u>Number of medical schools with expenditures per net square foot:</u>	
	<u>Below \$33.30</u>	<u>\$33.30 or above</u>
Net square feet per professional employee:		
Below 622 nsf	18	23
622 nsf or above	23	17

The other educational components and the 100 largest institutions show similar relationships.

There is some negative correlation between overcrowding and research expenditures per professional employee in all four of the principal categories of educational institutions examined. For medical schools, the results are as follows:

	<u>Number of medical schools with expenditures per professional employee:</u>	
	<u>Below \$22.9 thousand</u>	<u>\$22.9 thousand or above</u>
Overcrowding ratio:		
Under 29.7%	18	23
29.7% or over	23	17

The overcrowding ratio is the amount of space needed to relieve overcrowding divided by the amount currently used. The relationship, although not pronounced, persists through other health-professional, other academic and the 100 largest institutions. The institutions which are least crowded have a tendency toward the highest research expenditures per professional employee.

Analysis of the distributions of space needs to 1980 shows some significant relationships. Medians and quartile points are

shown in Table 2.10.9. for the expected growth factor to 1980, that is, the ratio of anticipated new construction needs to the amount of space currently in the inventory and under construction.

Table 2.10.9. Medians and quartile points of selected ratios:
Percent new construction needs to 1980 of current inventory and space under construction or fully funded.

Statistic	81 of 84 accredited medical schools	147 Other health- professional schools	205 Other academic institutions	99 of 100 largest academic institutions
First quartile point	48%	58%	54%	58%
Median	72	129	113	96
Third quartile point	144	318	233	139

Approximately one-fourth of the institutions expect health-related research space needs to increase by approximately one-half. At the upper end, however, there are wide differences among the four identified classes of institutions. One-fourth of the accredited medical schools expect more than a 144 percent increase, and this corresponds approximately to the increase expected in the 100 largest academic institutions. However, one-fourth of other health-professional schools expect more than a three-fold increase. This is only slightly influenced by the inclusion of the two-year and emerging four-year medical schools in this group, since their total number is only 16.

One-fourth of the other academic institutions expect over a two-fold increase. These needs are heavily weighted by university science departments.

Some cross tabulations help to clarify the nature of the needs. Only the data for the 100 largest academic institutions will be shown. These institutions, as observed above, contain most of the health-professional schools and many of the major science departments that are involved in health-related research.

The following data show that the institutions receiving the greatest relative amount of assistance from Health Research Facilities construction grants since 1957 tend to have the lowest needs for expansion to 1980, although the relationship is not a close one.

Number of institutions with 1980
expected H-R research space
growth factors:

Percent HRF grant assistance since 1956:	<u>Below 96%</u>	<u>96% or above</u>
Under 70. 8%	20	30
70. 8% and above	29	19

HRF grant assistance is the percentage of health-related research space built since 1956 which was built with the assistance of Health Research Facilities construction grants.

A similar relationship is shown when 1980 expansion factors are compared against the proportion of space in satisfactory condition.

Number of institutions with 1980 ex-
pected H-R research space growth
factors:

Percent of space inventory in satisfactory condition:	<u>Below 96%</u>	<u>96% or above</u>
Less than 76. 2%	22	27
76. 2% and above	29	22

Again, there is some relationship, but not a pronounced one. A more pronounced relationship exists between 1980 projections and current needs of space to relieve overcrowding.

	Number of institutions with 1980 expected H-R research space growth factors:	
Overcrowding index:	<u>Below 96%</u>	<u>96% or above</u>
Below 30. 0%	31	18
30. 0% or above	17	30

Recall that the overcrowding index is the amount of space needed to relieve overcrowding as a percent of total currently used space. Apparently the 1980 projections reflect the need to catch up on space needed in current programs.

Some analysis was also done to determine whether size of medical school has any generalizable relationship with the analytical ratios computed. Four size classes were constructed, based upon number of entering students, as follows:

<u>Number of entering students</u>	<u>Class size</u>	<u>No. of medical schools</u>	<u>Total no. of students</u>
Less than 80	A	19	1289
80 to 119, inclusive	B	38	3704
120 to 149, inclusive	C	18	2383
150 and over	D	9	<u>1716</u>
Totals		84	9092

The distribution, with respect to the median, of research expenditures per professional employee is as follows:

Number of medical schools with
research expenditures per nsf:

Class size	<u>Below \$33.30</u>	<u>\$33.30 or over</u>
A	12	7
B	18	19
C	8	10
D	<u>4</u>	<u>5</u>
Totals	42	41

There is some tendency for size of school to be positively correlated with research expenditures per nsf of research space.

In terms of research expenditures per professional employee the correlation is reversed, as shown below:

Number of medical schools with
research expenditures per
professional employee:

Class size	<u>Below \$22.9 thousand</u>	<u>\$22.9 thousand or more</u>
A	9	9
B	16	22
C	9	9
D	<u>7</u>	<u>1</u>
Totals	41	41

The relationship is not pronounced, however.

Amount of space per professional employee is negatively correlated with size, the large schools having relatively smaller amounts of space.

Number of medical schools with nsf
of research space per professional
employee:

Class size	<u>Less than 622 nsf</u>	<u>622 nsf or more</u>
A	7	11
B	17	21
C	12	6
D	<u>6</u>	<u>2</u>
Total	42	40

Contribution of the Health Research Facilities construction program to the research space built since 1956 is related to size of schools as follows:

Number of medical schools with
percent of space built since 1956
with the assistance of Health
Research Facilities grants:

Class size	<u>Less than 86. 2%</u>	<u>86. 2% or more</u>
A	7	11
B	25	13
C	4	14
D	<u>6</u>	<u>3</u>
Total	42	41

The relationship to size is mixed, there being a pronounced difference between size classes B and C, that is, schools with from 80 to 119 beginning students and from 120 to 149 beginning students, respectively.

Research space built since 1956 is negatively correlated with size of school, as follows:

Number of medical schools with percent of research space built since 1956:

Class size	<u>Below 61.3%</u>	<u>61.3% or over</u>
A	8	11
B	16	22
C	11	7
D	<u>7</u>	<u>2</u>
Total	42	42

That is, the larger schools tended to expand more slowly since 1956 than the smaller schools.

With respect to percent of space in satisfactory condition, there appears to be little relationship to size of school. The same holds for growth rate projected to 1980.

The above analysis has concentrated on those analytical ratios which seem to show departures from what one would expect by a random allocation of institutions to the quartiles. Twenty separate ratios were examined, so that twenty one-way frequency distributions could have been constructed and 190 cross frequency distributions. A complete display of all of these is obviously not practical, so judgment has been exercised in displaying those which appear to assist in analytical perspective. A data base has been constructed which can be used for further analytical studies at a later date.

2.11. Summary of selected survey data by state.

Some selected data have been presented by state in Table 2.11.1. These data have been aggregated over all kinds of reporting institutions in each state in order to preserve confidentiality of data reported by the respondents.

Table 2.1.1. Mailing list and survey by kind of institution.

Kind of institution	Mailing list		Survey response	
	Number of institutions	Number of* reporting components	Number of institutions	Number of completed Part B's
Academic institutions	400	646	263	470
Independent hospitals	310	310	182	182
Independent research institutions	240	240	145	145
State and local health departments	90	**	48	128
All other institutions	53	53	33	33
Totals	1093	**	671	958

* Each academic institution was requested to submit one Part B for each health-professional school and one aggregate Part B for the remainder of its research activities. Each major campus in the University of California system, the University of Texas system and the State University of New York system was considered to be a separate institution for counting purposes.

** State and local health departments were requested to complete one Part B for each component having 5,000 nsf of health-related research space or more and one aggregate Part B response for all other components of the department.

Table 2.1.2. Survey response* by number and amount of fiscal 1967 Public Health Service research grants.

Kind of institution	Number of Grants				Amount of grants (Thousands of dollars)	
	To institutions on mailing list	To respondents	%	To institutions on mailing list	To respondents	%
Academic institutions	13,009	12,718	97.8	\$535,169	\$529,182	98.9
Independent hospitals	1,308	1,232	94.2	63,714	60,949	95.7
Independent research institutions	826	695	84.1	53,660	48,245	89.9
State and local health departments	623	467	75.0	37,207	28,427	76.4
All other institutions	182	159	87.4	9,283	8,196	88.3
Totals	15,948	15,271	95.8	\$699,033	\$674,999	96.6

*Institutions returning at least one completed Part B.

Table 2.1.3. Survey response of academic institutions by reporting component.

Reporting component	Number in institutions on mailing list	Number responding	Percent responding
Dental schools	55	50	91
Medical schools	101	100	99
Schools of pharmacy	74	63	85
Schools of public health	15	13	87
Schools of veterinary medicine	18	17	94
Other academic components	385	227	59
Total academic components	648	470	73

Table 2.2.1. Health-related research space owned by respondents.

Kind of institution	Used by respondents		Used by another institution		Total space owned by respondents		All owned H-R space %
	Thousands of nsf	%	Thousands of nsf	%	Thousands of nsf	%	
Medical schools	13,784	99.9	20	0.1	13,804	100.0	36.1
Other H-P schools*	3,077	99.6	12	0.4	3,089	100.0	8.1
Other academic institutions	13,171	99.4	82	0.6	13,253	100.0	34.7
Independent hospitals	2,273	66.3	1,156	33.7	3,429	100.0	9.0
All other institutions	4,225	91.1	412	8.9	4,637	100.0	12.1
Totals	36,530	95.6	1,682	4.4	38,212	100.0	100.0

* Health-professional

Table 2.2.2. Health-related research space used by respondents.

Kind of institution	Owned by respondents		Owned by another institution		Rented		Total		Percent of space used
	Thousands of nsf	%	Thousands of nsf	%	Thousands of nsf	%	Thousands of nsf	%	
Medical schools	13,784	79.3	3,092	17.8	502	2.9	17,378	100.0	41.9
Other H-P schools*	3,077	94.8	53	1.6	115	3.6	3,245	100.0	7.8
Other academic institutions	13,171	97.9	100	0.7	189	1.4	13,460	100.0	32.4
Independent hospitals	2,273	95.1	60	2.5	57	2.4	2,390	100.0	5.8
All other institutions	4,225	84.5	406	8.1	371	7.4	5,002	100.0	12.1
Totals	36,530	88.1	3,711	8.9	1,234	3.0	41,475	100.0	100.0

* Health-professional

Table 2.2.3. Health-related research space used, but not owned, by medical schools.

Space ownership	Thousands of nsf	%
Academic institutions	68	2.2
Independent hospitals	2,287	74.1
Independent research institutions	63	2.0
VA hospitals	520	16.8
Institutions not responding to survey	153	4.9
Total	3,091	100.0

Table 2.2.4. Inter-institutional use of health-related research space.

Institution owning space	Total	Kind of institution used by			
		Medical schools	Other H-P schools	Other academic institutions	Independent hospitals
		(Thousands of nsf)			
Medical schools	40	1	7	6	22
Other H-P schools*	15	9	-	-	3
Other academic institutions	96	58	8	11	5
Independent hospitals	2,492	2,287	27	55	22
All other institutions	1,068	737	10	28	8
Total	3,711	3,092	52	100	60
					407

* Health-professional

Table 2.3.1. Age of health-related research space owned by reporting institutions.

Kind of institution	Date of construction						Total	
	Prior to 1940		Jan '40 - Dec '56, inclusive		Since 1956*			
	Thou. nsf	%	Thou. nsf	%	Thou. nsf	%	Thou. nsf	%
Medical schools	3,026	21.9	2,878	20.9	7,900	57.2	13,804	100.0
Other H-P schools**	616	19.9	638	20.7	1,835	59.4	3,089	100.0
Other academic institutions	3,907	29.5	2,507	18.9	6,838	51.6	13,253	100.0
Independent hospitals	964	28.1	519	15.1	1,947	56.8	3,429	100.0
All other institutions	990	21.4	1,171	25.2	2,475	53.4	4,637	100.0
Totals	9,503	24.9	7,713	20.2	20,995	54.9	38,212	100.0

* Includes 520 thousand nsf of space whose age was not reported.

**Health-professional

Table 2.3.2. Age of health-related research space owned by institutions that were recipients of Health Research Facilities construction grants.

Kind of institution	Date of construction						Total	
	Prior to 1940		Jan '40 - Dec '56, inclusive		Since 1956*		Thou. nsf	%
	Thou. nsf	%	Thou. nsf	%	Thou. nsf	%		
Medical schools	3,026	22.2	2,795	20.6	7,779	57.2	13,600	100.0
Other H-P schools **	411	16.7	440	17.9	1,612	65.4	2,463	100.0
Other academic institutions	3,409	29.9	2,155	18.9	5,835	51.2	11,399	100.0
Independent hospitals	723	25.1	449	15.6	1,713	59.3	2,885	100.0
All other institutions	624	20.2	662	21.5	1,799	58.3	3,085	100.0
Totals	8,193	24.5	6,501	19.4	18,738	56.1	33,432	100.0

* Includes 499 thousand nsf of space whose age was not reported.

**Health-professional

Table 2.3.3. Age of health-related research space owned by reporting institutions who were not recipients of Health Research Facilities construction grants.

Kind of institution	Date of construction						Total	
	Prior to 1940		Jan '40 - Dec '56, inclusive		Since 1956*			
	Thou, nsf	%	Thou, nsf	%	Thou, nsf	%	Thou, nsf	%
Medical schools			83	40.7	121	59.3	204	100.0
Other H-P schools**	205	32.7	198	31.7	223	35.6	626	100.0
Other academic institutions	498	26.9	352	19.0	1,003	54.1	1,854	100.0
Independent hospitals	241	44.2	70	12.8	234	43.0		100.0
All other institutions	366	23.6	509	32.8	676	43.6	1,552	100.0
Totals	1,310	27.4	1,212	25.4	2,257	47.2	4,780	100.0

*Includes 21 thousand nsf of space whose age was not reported.

**Health-professional

Table 2.3.4. Condition of health-related space owned by reporting institution,

Kind of institution	Condition				Total	
	Satisfactory*	Should be remodeled	Thousands of nsf	%	Thousands of nsf	%
Medical schools	10,214	74.0	2,535	18.4	1,055	7.6
Other H-P schools**	2,267	73.4	426	13.8	396	12.8
Other academic institutions	9,420	71.1	2,458	18.5	1,375	10.4
Independent hospitals	2,556	74.5	463	13.5	410	12.0
All other institutions	3,547	76.5	579	12.5	511	11.0
Totals	28,004	73.3	6,461	16.9	3,747	9.8
					38,212	100.0

*Includes 217 thousand nsf of space whose condition was not reported.

**Health-professional

Table 2.3.5. Condition of health-related research space owned by institutions that were recipients of
Health Research Facilities construction grants.

Kind of institution	Condition				Total	
	Satisfactory *	Should be remodeled	Should be replaced		Thousands of nsf	%
Medical schools	10,013	73.6	2,533	18.6	1,054	7.8
Other H-P schools**	1,828	74.2	338	13.7	297	12.1
Other academic institutions	8,233	72.2	2,111	18.5	1,055	9.3
Independent hospitals	2,112	73.2	410	14.2	363	12.6
All other institutions	2,356	76.4	387	12.5	342	11.1
Totals	24,542	73.4	5,779	17.3	3,111	9.3
					33,432	100.0

* Includes 208 thousand nsf of space whose condition was not reported.
** Health-professional

Table 2.3.6. Condition of health-related research space owned by institutions that had not received
Health Research Facilities construction grants.

Kind of institution	Condition			Total	
	Satisfactory*	Should be remodeled	Should be replaced	Thousands of nsf	%
Medical schools	201	98.5	2	1.0	0.5
Other H-P schools**	439	70.1	88	14.1	15.8
Other academic institutions	1,187	64.0	347	18.7	320
Independent hospitals	444	81.6	53	9.8	47
All other institutions	1,191	76.7	192	12.4	169
Totals	3,462	72.4	682	14.3	636
				13.3	1,552
				4,780	100.0

* Includes 9 thousand nsf of space whose condition was not reported.

** Health-professional

Table 2.3.7. Age and condition of all health-related research space owned by reporting institutions.

Age of Space	Condition				Total	
	Satisfactory*	Should be remodeled	Should be replaced		Thousands of nsf	%
Prior to 1940	Thousands of nsf	Thousands of nsf	Thousands of nsf	%	Thousands of nsf	%
3,901	41.1	3,057	32.2	2,529	26.7	9,487
4,798	63.8	1,811	24.1	912.	12.1	7,521
Since 1956**	19,306	91.1	1,594	7.5	304	1.4
						21,204
Totals	28,005	73.3	6,462	16.9	3,745	9.8
						38,212
						100.0

* Includes 217 thousand nsf of space whose condition was not reported.

** Includes 520 thousand nsf of space whose age was not reported.

Table 2.3.8. Age and condition of all health-related research space owned by institutions that were recipients of Health Research Facilities construction grants.

Age of Space	Condition				Total	
	Satisfactory*	Should be remodeled	Should be replaced		Thousands of nsf	%
Thousands of nsf	Thousands of nsf	Thousands of nsf	Thousands of nsf	Thousands of nsf	Thousands of nsf	%
Prior to 1940	3,269	39.9	2,771	33.8	2,153	26.3
Jan 1940-Dec 1956 inclusive	4,156	63.9	1,620	24.9	725	11.2
Since Jan 1957**	17,117	91.3	1,388	7.4	233	1.3
Totals	24,542	73.4	5,779	17.3	3,111	9.3
					33,432	100.0

* Includes 208 thousand nsf of space whose condition was not reported.

** Includes 499 thousand nsf of space whose age was not reported.

Table 2.3.9. Age and condition of health-related research space owned by institutions that have not received Health Research Facilities construction grants.

Age of Space	Condition				Total	
	Satisfactory Thousands of nsf	%	Should be remodeled Thousands of nsf	%		
Prior to 1940	632	48.8	286	22.1	376	29.1
Jan 1940-Dec 1956 inclusive	642	62.9	191	18.7	187	18.4
Since Jan 1957**	2,189	88.8	206	8.4	71	2.8
Totals	3,463	72.4	683	14.3	634	13.3
					4,780	100.0

* Includes 11 thousand nsf of space whose condition was not reported.

** Includes 21 thousand nsf of space whose age was not reported.

Table 2.3.10. Health-related research space built since 1956, by kind of institution and Health Research Facilities grants participation.

Kind of institution	Space built since Jan 1957*			Total		
	Thou. nsf	HRF assist. % ^a	Other Thou. nsf	% ^a	Thou. nsf	% ^a
Medical schools	6,208	78.6	1,692	21.4	7,900	100.0
Other H-P schools**	815	44.4	1,020	55.6	1,835	100.0
Other academic institutions	3,213	47.0	3,625	53.0	6,838	100.0
Independent hospitals	1,261	64.8	686	35.2	1,947	100.0
All other institutions	1,208	48.8	1,267	51.2	2,475	100.0
Totals	12,705	60.5	8,290	39.5	20,995	100.0

* Includes 520 thousand nsf of space whose age was not reported.

** Health-professional

Table 2.3.11. Health-related research space remodeled since 1956 by kind of institution and Health Research Facilities grant participation.

Kind of institution	Space remodeled since 1956			Space remodeled since 1956		
	HRF assist. Thou. nsf	% %	Other Thou. nsf	Other % %	Total Thou. nsf	Total % %
Medical schools	901	31.0	2,002	69.0	2,903	100.0
Other H-P schools*	139	23.1	462	76.9	601	100.0
Other academic institutions	329	13.4	2,123	86.6	2,452	100.0
Independent hospitals	250	26.0	712	74.0	962	100.0
All other institutions	241	20.9	912	79.1	1,153	100.0
Totals	1,860	23.0	6,211	77.0	8,071	100.0

*Health-professional

Table 2.4.1. Health-related research space under construction or fully funded for construction.

Kind of institution	Space under construction or fully funded	
	Thousands of nsf	% of space currently in use
Medical schools	3,924	22.6
Other H-P schools*	692	21.3
Other academic institutions	2,871	21.8
Independent hospitals	620	25.9
All other institutions	480	9.6
Totals	8,587	15.9

*Health-professional

Table 2.4.2. Health-related research space under construction or fully funded by kind of institution and Health Research Facilities grant participation.

Kind of institution	Space under construction or fully funded					Total
	Thou. of nsf	HRF assist. %	Thou. of nsf	Other %	Thou. of nsf	
Medical schools	2,583	65.8	1,341	34.2	3,924	100.0
Other H-P schools*	446	64.5	246	35.5	692	100.0
Other academic institutions	350	12.2	2,521	87.8	2,871	100.0
Independent hospitals	399	64.4	221	35.6	620	100.0
All other institutions	81	16.9	399	83.1	480	100.0
Totals	3,859	44.9	4,728	55.1	8,587	100.0

*Health-professional

Table 2.4.3. Health-related research space being remodeled or for which remodeling is fully funded.

Kind of institution	Space being remodeled or for which remodeling is fully funded	
	Thousands of nsf	% of space currently in use
Medical schools	699	4.0
Other H-P schools*	106	3.3
Other academic institutions	422	3.1
Independent hospitals	151	6.3
All other institutions	162	3.2
Totals	1,540	3.7

*Health-professional

Table 2.4.4. Health-related research space being remodeled or for which remodeling is fully funded by kind of institution and Health Research Facilities grant participation.

Kind of institution	Space being remodeled or for which remodeling is fully funded					
	HRF assist. Thou. of nsf	%	Other Thou. of nsf	%	Total Thou. of nsf	%
Medical schools	364	52.1	335	47.9	699	100.0
Other H-P schools*	7	6.6	99	93.4	106	100.0
Other academic institutions	26	6.2	396	93.8	422	100.0
Independent hospitals	73	48.3	78	51.7	151	100.0
All other institutions	24	14.8	138	85.2	162	100.0
Totals	494	32.1	1,046	67.9	1,540	100.0

*Health-professional

Table 2.4.5. Sources of funds for ongoing new construction and remodeling.

Kind of institution	Source of funds - weighted average in per cent					Total
	Institutions' unrestricted funds	Institutional borrowing	Private funds restricted for construction and remodeling	Construction funds from state and local governments	Federal sources	
Medical schools	13.51	3.74	17.59	23.61	39.20	2.35
Other H-P schools*	7.16	3.78	5.81	44.87	37.84	0.54
Other academic institutions	4.18	0.78	1.67	66.75	26.46	0.16
Independent hospitals	28.21	2.49	30.71	3.44	32.48	2.67
All other institutions	17.47	4.34	8.23	43.18	21.01	5.77
Totals	9.33	2.06	9.07	47.13	31.23	1.18
						100.00

*Health-professional

Table 2.5.1. Employees engaged in health-related research.

Kind of institution	Professional staff		Postdoctoral research fellows and trainees	Graduate students	All other	Total
	Number	nsf of H-R research space used per professional employee *				
Medical schools	27,788	625	6,706	8,748	42,301	85,543
Other H-P schools**	4,751	683	807	4,158	5,264	14,980
Other academic institutions	14,540	926	2,705	23,654	17,822	58,721
Independent hospitals	4,084	583	1,275	375	7,105	12,839
All other institutions	6,764	738	905	869	11,604	20,142
Totals	57,927	716	12,398	37,804	84,096	192,225

* For those institutions reporting both nsf used and professional staff.

**Health-professional

Table 2.5.2. Health-related research space needed to relieve overcrowding.

Kind of institution	Number of institutions reporting needs	H-R research space being used by present H-R research staff*	Additional space needed to relieve overcrowding (Thousands of nsf)	% increase needed
Medical schools	81	15,558	5,779	37.1
Other H-P schools**	104	2,910	1,762	60.5
Other academic institutions	175	12,401	4,747	38.3
Independent hospitals	95	2,149	1,049	48.8
All other institutions	133	4,507	1,466	32.5
Totals	588	37,525	14,803	39.5

* Space reported by institutions who also reported needs. The total is less than the total of all space reported used in Table 2.2.2.

**Health-professional

Table 2. 6. 1. Annual health-related research expenditures by kind of institution and source of funding.

Kind of institution	Total*			Total 1967 PHS research grants to respondents			
	Sponsored research	Other separately budgeted projects	Total*				
Thousands of dollars	% of total	Thousands of dollars	% of total	Thousands of dollars	% of total	Thousands of dollars	% of total
Medical schools	542, 984	91. 4	51, 328	8. 6	594, 312	100. 0	
Other H-P schools**	57, 621	80. 1	14, 337	19. 9	71, 958	100. 0	529, 182
Other academic institutions	213, 074	73. 6	76, 478	26. 4	289, 552	100. 0	
Independent hospitals	102, 792	83. 5	20, 252	16. 5	123, 044	100. 0	60, 949
All other institutions	134, 054	70. 4	56, 253	29. 6	190, 307	100. 0	84, 868
Totals	1, 050, 525	82. 8	218, 648	17. 2	1, 269, 173	100. 0	674, 999

*Generally 1968 expenditures. See text for further discussion.

**Health-professional

Table 2.6.2. Health-related research expenditures per nsf of space and per professional staff member.

Kind of institution	Dollars per nsf of H-R research space	Dollars per professional employee
Medical schools	\$34.79	\$21,804
Other H-P schools*	22.48	16,067
Other academic institutions	21.45	21,081
Independent hospitals	50.12	31,781
All other institutions	41.34	33,119
Totals	\$31.04	\$22,744

*Health-professional

Table 2.7.1. Additional health-related research space needed by 1980.

Kind of institution	Additional space needs to 1980			Remodeling needed (Thousands of nsf)	% of 1968 total owned space
	Number of institutions reporting	Space needed (Thousands of nsf)	% of 1968 total owned space		
Medical schools	94	20,728	150.2	80	7,591
Other H-P schools*	117	6,080	196.8	81	1,447
Other academic institutions	189	20,120	151.8	152	5,114
Independent hospitals	111	3,236	94.4	85	1,355
All other institutions	152	4,242	91.5	108	1,774
Totals	663	54,491	142.6	506	17,281
					45.3

*Health-professional

Table 2.7.2. Planned use of new construction to 1980.

Kind of institution	Total space for which planned use was reported Thou. of nsf	Reported planned use		
		Existing programs Number of institutions reporting	New programs Number of institutions reporting	Other Number of institutions reporting
Medical schools	13,029	45 5,130	47 6,896	9 1,003
Other H-P schools*	3,953	60 1,865	56 2,001	3 87
Other academic institutions	10,787	80 6,164	84 4,534	7 89
Independent hospitals	1,754	47 651	53 1,017	8 86
All other institutions	2,710	66 1,482	59 969	17 259
Totals	32,233	298 47.5	299 15,417 47.8	44 1,524 4.7
Percent	100.0			

*Health-professional

Table 2.7.3. Planned use of remodeling to 1980.

Kind of institution	Total space for which planned use was reported Thou. of nsf	Reported planned use			
		Existing programs Number of institutions reporting	New programs Number of institutions reporting	Number of Thousands of nsf	Other Number of institutions reporting Thousands of nsf
Medical schools	3,926	35	1,803	26	1,390
Other H-P schools*	559	32	310	24	204
Other academic institutions	2,044	60	1,245	43	589
Independent hospitals	464	30	242	26	220
All other institutions	593	39	342	27	210
Totals	7,586	196	3,942	146	2,613
Percent	100.0		52.0	34.4	35
					1,031
					13.6

*Health-professional

Table 2.7.4. Total reported cost and source of funds for new construction and remodeling needs to 1980.

Kind of institution	New construction		Remodeling	
	Reported total cost (Millions)	% of total available from non-federal sources	Reported total cost (Millions)	% of total available from non-federal sources
Medical schools	\$ 1,436	40.6	\$ 281	30.5
Other H-P schools*	366	40.1	30	33.8
Other academic institutions	1,149	44.2	159	50.0
Independent hospitals	230	31.5	52	30.4
All other institutions	221	53.7	51	48.4
Totals	\$ 3,402	42.0	\$ 573	37.9

*Health-professional

Table 2.8.1. Estimate of percentage of health-related research space requiring remodeling each year,

Kind of institution	No. %	Distribution of responses									Total 100.0
		Less than 2.5% 2.5%	2.5- 7.49	7.5- 12.49	12.5- 17.49	17.5- 22.49	22.5- 27.49	27.5- 32.49	32.5- 37.49	37.5- 42.49	
Medical schools	No. %	3 3.2	26 28.3	37 40.2	13 14.1	11 12.0	1 1.1	1 1.1	1 1.1	1 1.1	92 100.0
Other H-P schools*	No. %	11 8.5	33 25.0	54 40.9	7 5.3	18 13.6	4 3.0	2 1.5	.7 .7	2 1.5	132 100.0
Other academic institutions	No. %	6 3.0	39 19.6	89 44.7	26 13.1	26 13.1	6 3.0	1 .5	2 1.0	4 2.0	199 100.0
Independent hospitals	No. %	17 11.0	30 19.6	56 36.4	14 9.1	25 16.2	9 5.8	1 .6	1 .6	2 1.3	154 100.0
All other institutions	No. %	55 20.7	43 16.3	95 36.0	25 9.5	30 11.4	9 3.4	3 1.1	2 .8	2 .8	264 100.0
Totals	No. %	92 10.9	171 20.3	331 39.4	85 10.1	110 13.1	29 3.4	6 .7	1 .7	10 1.2	841 100.0

*Health-professional

Table 2.9.1. Health-related research space used in the care and housing of animals, by source of assistance with its construction.

Kind of institution	Total H-R space in use (Thousands of nsf)	Portion representing animal space		Animal space built or remodeled with HRF assistance	
		(Thousands of nsf)	Percent	(Thousands of nsf)	Percent
Medical schools	17, 378	1, 814	10.4	904	49.8
Other H-P schools*	3, 245	531	16.4	181	34.1
Other academic institutions	13, 460	1, 242	9.2	264	21.3
Independent hospitals	2, 390	414	17.3	153	37.0
All other institutions	5, 002	682	13.6	312	45.7
Totals	41, 475	4, 683	11.3	1, 814	38.7

*Health-professional

Table 2.9.2. Health-related research space, used for the care and housing of animals, which is being constructed or for which construction is fully funded.

Kind of institution	Total H-R research space being constructed or which is fully funded Thousands of nsf	Animal space	
		Thousands of nsf	% of total new construction
Medical schools	3,924	563	14.3
Other H-P schools*	692	136	19.7
Other academic institutions	2,871	292	10.2
Independent hospitals	620	86	13.9
All other institutions	480	48	10.0
Totals	8,587	1,125	13.1

*Health-professional

Table 2.9.3. Health-related research space, used for the care and housing of animals, which is being remodeled or for which remodeling is fully funded.

Kind of institution	Total H-R research space being remodeled or which is fully funded Thousands of nsf	Animal space	
		Thousands of nsf	% of total remodeling
Medical schools	699	80	11.4
Other H-P schools*	106	22	20.8
Other academic institutions	422	38	9.0
Independent hospitals	151	33	21.9
All other institutions	162	26	16.0
Totals	1,540	199	12.9

*Health-professional

Table 2.9.4. Additional health-related research space for the care and housing of animals needed by 1980.

Kind of institution	New construction		Remodeling	
	Animal space Thousands of nsf	% of total 1980 new space requirements	Animal space Thousands of nsf	% of total 1980 remodeling requirements
Medical schools	2,254	10.9	648	8.5
Other H-P schools*	1,082	17.8	152	10.5
Other academic institutions	1,949	9.7	370	7.2
Independent hospitals	363	11.2	69	5.1
All other institutions	690	16.3	131	7.4
Totals	6,338	11.6	1,370	7.9

*Health-professional

Table 2.11.1.

Summary of Selected HRF Survey Data, by State
(Thousands of nsf and dollars)

Item	Total U.S. Puerto Rico and D. C.	Alabama	Alaska	Arizona	Arkansas
Nsf of health-related research (H-R) space used by respondents, 1968	41,475	362	22	245	172
Condition of H-R space owned:					
Satisfactory	28,004	256	21	222	139
Needs remodeling	6,463	52	-	4	31
Needs replacement	3,746	31	2	6	2
Nsf of H-R space needed to relieve current over- crowding	14,805	205	25	87	95
Dollars of H-R research:	\$1,269,173	\$12,382	\$1,313	\$3,691	\$3,487
H-R space currently under construction:					
New construction	8,587	154	4	45	-
Remodeling	1,540	-	-	-	-
Additional H-R space needed by 1980:					
New construction	54,408	716	38	322	227
Remodeling	17,281	123	3	14	167

Table 2.11.1.

Summary of Selected HRF Survey Data, by State
(Thousands of nsf and dollars)

Item	Total U. S. Puerto Rico and D. C.	California	Colorado	Connecticut	Delaware
Nsf of health-related research (H-R) space used by respondents, 1968	41,475	4,317	494	715	22
Condition of H-R space owned:					
Satisfactory	28,004	2,862	287	359	20
Needs remodeling	6,463	525	131	184	-
Needs replacement	3,746	473	59	111	-
Nsf of H-R space needed to relieve current over-crowding	14,805	1,096	152	191	12
Dollars of H-R research:					
H-R space currently under construction:	\$1,269,173	\$133,431	\$21,346	\$18,495	\$417
New construction	8,587	579	112	333	-
Remodeling	1,540	100	120	9	-
Additional H-R space needed by 1980:					
New construction	54,408	4,593	1,116	646	44
Remodeling	17,281	1,569	174	112	10

Table 2.11.1.

Summary of Selected HRF Survey Data, by State
(Thousands of nsf and dollars)

Item	Total U.S. Puerto Rico and D. C.	District of Columbia	Florida	Georgia	Hawaii
Nsf of health-related research (H-R) space used by respondents, 1968	41,475	444	789	556	89
Condition of H-R space owned:					
Satisfactory	28,004	211	538	391	41
Needs remodeling	6,463	20	35	82	14
Needs replacement	3,746	95	65	45	15
Nsf of H-R space needed to relieve current over-crowding	14,805	165	212	198	14
Dollars of H-R research:	\$1,269,173	\$18,409	\$21,622	\$13,789	\$3,346
H-R space currently under construction:					
New construction	8,587	32	137	261	43
Remodeling	1,540	24	15	10	2
Additional H-R space needed by 1980:					
New construction	54,408	880	2,075	650	128
Remodeling	17,281	158	636	239	27

Table 2.11.1.

Summary of Selected HRF Survey Data, by State
(Thousands of nsf and dollars)

Item	Total U. S. Puerto Rico and D. C.	Idaho	Illinois	Indiana	Iowa
Nsf of health-related research (H-R) space used by respondents, 1968	41,475	-	2,336	958	637
Condition of H-R space owned:					
Satisfactory	28,004	-	1,669	721	348
Needs remodeling	6,463	-	328	164	119
Needs replacement	3,746	-	161	49	139
Nsf of H-R space needed to relieve current over- crowding	14,805	-	708	297	280
Dollars of H-R research:	\$1,269,173	-	\$66,653	\$21,929	\$13,887
H-R space currently under construction:					
New construction	8,587	-	610	36	127
Remodeling	1,540	-	70	57	17
Additional H-R space needed by 1980:					
New construction	54,408	-	2,974	1,051	597
Remodeling	17,281	-	722	283	220

Table 2.11.1.

Summary of Selected HRF Survey Data, by State
 (Thousands of nsf and dollars)

Item	Total U. S. Puerto Rico and D. C.	Kansas	Kentucky	Louisiana	Maine
Nsf of health-related research (H-R) space used by respondents, 1968	41,475	592	503	627	103
Condition of H-R space owned:					
Satisfactory	28,004	440	417	431	37
Needs remodeling	6,463	87	23	116	36
Needs replacement	3,746	56	58	32	27
Nsf of H-R space needed to relieve current over- crowding	14,805	156	183	345	35
Dollars of H-R research:	\$1,269,173	\$13,626	\$9,347	\$16,249	\$2,818
H-R space currently under construction:					
New construction	8,587	197	145	177	1
Remodeling	1,540	1	9	41	1
Additional H-R space needed by 1980:					
New construction	54,408	509	359	1,018	106
Remodeling	17,281	121	75	363	36

Table 2.11.1.

Summary of Selected HRF Survey Data, by State
 (Thousands of nsf and dollars)

Item	Total U. S. Puerto Rico and D. C.	Maryland	Massachusetts	Michigan	Minnesota
Nsf of health-related research (H-R) space used by respondents, 1968	41,475	916	2,531	1,822	824
Condition of H-R space owned:					
Satisfactory	28,004	710	1,746	1,227	518
Needs remodeling	6,463	241	375	210	125
Needs replacement	3,746	89	286	193	96
Nsf of H-R space needed to relieve current over-crowding	14,805	216	798	458	528
Dollars of H-R research:					
H-R space currently under construction:					
New construction	8,587	157	735	450	12
Remodeling	1,540	22	144	43	19
Additional H-R space needed by 1980:					
New construction	54,408	1,118	2,801	2,298	764
Remodeling	17,281	650	1,024	685	150

Table 2.11.1.

Summary of Selected HRF Survey Data, by State
(Thousands of nsf and dollars)

Item	Total U.S. Puerto Rico and D. C.	Mississippi	Missouri	Montana	Nebraska
Nsf of health-related research (H-R) space used by respondents, 1968	41,475	440	1,137	81	138
Condition of H-R space owned:					
Satisfactory	28,004	429	679	61	100
Needs remodeling	6,463	10	252	3	18
Needs replacement	3,746	-	106	17	6
Nsf of H-R space needed to relieve current over-crowding	14,805	44	755	97	67
Dollars of H-R research:	\$1,269,173	\$4,336	\$31,236	\$1,465	\$3,120
H-R space currently under construction:					
New construction	8,587	34	239	-	14
Remodeling	1,540	9	65	10	1
Additional H-R space needed by 1980:					
New construction	54,408	390	2,213	120	208
Remodeling	17,281	319	391	15	73

Table 2.11.1.

Summary of Selected HRF Survey Data, by State
(Thousands of nsf and dollars)

Item	Total U. S. Puerto Rico and D. C.	Nevada	New Hampshire	New Jersey	New Mexico
Nsf of health-related research (H-R) space used by respondents, 1968	41,475	17	165	627	250
Condition of H-R space owned:					
Satisfactory	28,004	-	132	425	88
Needs remodeling	6,463	-	27	83	17
Needs replacement	3,746	10	-	71	20
Nsf of H-R space needed to relieve current over- crowding	14,805	30	63	130	31
Dollars of H-R research:					
H-R space currently under construction:	\$1,269,173	\$300	\$3,418	\$11,304	\$5,613
New construction	8,587	50	67	501	5
Remodeling	1,540	10	18	13	1
Additional H-R space needed by 1980:					
New construction	54,408	125	1,191	1,285	205
Remodeling	17,281	-	69	105	164

Table 2.11.1.

Summary of Selected HRF Survey Data, by State
(Thousands of nsf and dollars)

Item	Total U. S. Puerto Rico and D. C.	New York	North Carolina	North Dakota	Ohio
Nsf of health-related research (H-R) space used by respondents, 1968	41,475	6,205	1,075	109	1,540
Condition of H-R space owned:					
Satisfactory	28,004	4,226	654	81	982
Needs remodeling	6,463	1,006	304	13	236
Needs replacement	3,746	332	70	14	217
Nsf of H-R space needed to relieve current over- crowding	14,805	2,615	262	62	693
Dollars of H-R research:	\$1,269,173	\$240,021	\$38,389	\$1,908	\$49,833
H-R space currently under construction:					
New construction	8,587	918	333	-	293
Remodeling	1,540	244	50	5	45
Additional H-R space needed by 1980:					
New construction	54,408	7,186	1,470	152	2,189
Remodeling	17,281	2,452	884	28	488

Table 2.11.1.

Summary of Selected HRF Survey Data, by State
(Thousands of nsf and dollars)

Item	Total U.S. Puerto Rico and D. C.	Oklahoma	Oregon	Pennsylvania	Rhode Island
Nsf of health-related research (H-R) space used by respondents, 1968	41,475	225	447	2,546	153
Condition of H-R space owned:					
Satisfactory	28,004	179	330	1,749	134
Needs remodeling	6,463	20	80	487	7
Needs replacement	3,746	22	25	236	2
Nsf of H-R space needed to relieve current over-crowding	14,805	73	161	1,076	89
Dollars of H-R research:					
H-R space currently under construction:	\$1,269,173	\$8,471	\$15,251	\$86,143	\$3,669
New construction	8,587	9	49	700	61
Remodeling	1,540	5	10	120	4
Additional H-R space needed by 1980:					
New construction	54,408	299	391	4,060	201
Remodeling	17,281	73	261	1,550	17

Table 2.11.1.

Summary of Selected HRF Survey Data, by State
(Thousands of nsf and dollars)

Item	Total U.S. Puerto Rico and D.C.	South Carolina	South Dakota	Tennessee	Texas
Nsf of health-related research (H-R) space used by respondents, 1968	41,475	92	35	544	2,026
Condition of H-R space owned: ⁹⁸					
Satisfactory	28,004	69	24	391	1,573
Needs remodeling	6,463	9	6	90	154
Needs replacement	3,746	11	5	35	75
Nsf of H-R space needed to relieve current over- crowding	14,805	145	15	236	522
Dollars of H-R research: H-R space currently under construction:	\$1,269,173	\$2,359	\$319	\$15,703	\$54,810
New construction	8,587	28	-	24	264
Remodeling	1,540	-	1	18	74
Additional H-R space needed by 1980:					
New construction	54,408	396	26	276	2,535
Remodeling	17,281	105	25	375	847

Table 2.11.1.

Summary of Selected HRF Survey Data, by State
(Thousands of nsf and dollars)

Item	Total U.S. Puerto Rico and D. C.	Utah	Vermont	Virginia	Washington
Nsf of health-related research (H-R) space used by respondents, 1968	41,475	468	260	455	849
Condition of H-R space owned:					
Satisfactory	28,004	278	193	386	513
Needs remodeling	6,463	95	49	41	141
Needs replacement	3,746	41	8	10	85
Nsf of H-R space needed to relieve current over-crowding	14,805	170	26	239	173
Dollars of H-R research:					
H-R space currently under construction:	\$1,269,173	\$8,483	\$3,285	\$11,660	\$19,499
New construction	8,587	95	3	138	126
Remodeling	1,540	12	-	6	25
Additional H-R space needed by 1980:					
New construction	54,408	606	94	835	1,301
Remodeling	17,281	180	76	148	317

Table 2.11.1.

Summary of Selected HRF Survey Data, by State
 (Thousands of nsf and dollars)

Item	Total U. S. Puerto Rico and D. C.	West Virginia	Wisconsin	Wyoming	Puerto Rico
Nsf of health-related research (H-R) space used by respondents, 1968	41,475	109	1,194	109	106
Condition of H-R space owned:					
Satisfactory	28,004	102	581	9	28
Needs remodeling	6,463	10	284	90	26
Needs replacement	3,746	2	197	10	30
Nsf of H-R space needed to relieve current over-crowding	14,805	35	401	80	57
Dollars of H-R research:	\$1,269,173	\$1,553	\$27,932	\$2,016	\$4,056
H-R space currently under construction:					
New construction	8,587	-	10	152	124
Remodeling	1,540	8	28	37	19
Additional H-R space needed by 1980:					
New construction	54,408	73	1,194	250	107
Remodeling	17,281	32	648	40	37

Part 3: Methodology and tables.

3.1. Survey methodology.

3.1.1. Survey population.

The mailing list of the non-profit institutions conducting health-related research was compiled from the following sources:

1. All institutions listed in the Public Health Service, Grants and Awards Fiscal 1967, Part I, Research as having been a recipient of PHS research grants during fiscal 1967. A few exceptions were made where grants were made to finance professional meetings. Table 3.1.1.2. contains data on the number and amount of research grants received by institutions on the mailing list during fiscal 1967.
2. Any academic institution not included in (1) above, that has one or more of the following health-professional schools:
 - a. Dental schools
 - b. Medical schools
 - c. Schools of pharmacy
 - d. Schools of public health
 - e. Schools of veterinary medicine
3. Any institution not included in (1) or (2) above that received a HRF Construction Grant since the inception of that program in 1957.
4. Any teaching hospital not included in (1) or (3) above that is listed in the "Council of Teaching Hospitals Membership Booklet."

Nine hundred and thirty-two of the 1,093 institutions on the mailing list were included as recipients of PHS research grants. These institutions accounted for over 99.3 percent of the total of over 703

million dollars of PHS research grant funding during fiscal 1967. A small number of institutions that received research grants during this period were not included on the mailing list due to the nature and size of the grants involved.

Eleven institutions having health-professional schools but not receiving PHS research grant support during this period were included on the mailing list. In addition, 91 teaching hospitals were included on the mailing list. The 11 health-professional schools and 91 teaching hospitals were included in the survey due to the active research programs normally found among these institutions. At the time the mailing list was compiled, a total of 400 institutions had received HRF construction grant support since the inception of that program in 1957. Three hundred forty-one of these institutions received PHS research grant support during fiscal 1967, but all 400 were included in the survey.

The number of health-professional schools identified and requested to respond to this survey are given in Table 3.1.1.1.

Table 3.1.1.1. Type and number of health-professional schools requested to respond to this survey.

Type of health-professional school	Number identified*
Dental schools	55
Medical schools	101
Schools of pharmacy	73
Schools of public health	15
Schools of veterinary medicine	19

* Included are a number of newly developing or two-year institutions.

It was felt that the institutions on this mailing list accounted for essentially all health-related research activities being carried out in

the nonprofit nonfederal sector. Some year-to-year changes were observed in the lists of institutions that received PHS research grant support during fiscal 1966 and 1967. However, the small size of the grants to institutions not on both lists and the lack of continuity in their research programs indicated that their research activities were comparatively minor.

Table 3.1.1.2. Public Health Service research grant support to institutions on the mailing list.

Kind of institution	Number of institutions	Number of PHS research grants	Dollar amount of PHS research grants (Thousands)
Academic institutions	400	13,009	\$535,169
Independent hospitals	310	1,309	63,714
Independent research institutions	240	826	53,660
State and local health departments	90	623	37,207
All other institutions	53	182	9,283
Totals	1,093	15,948	\$699,033

Tables 3.1.1.3. and 3.1.1.4. give data concerning the number of institutions that received PHS research grant and HRF construction grant support, respectively.

Table 3.1.1.3. Public Health Service research grant support to institutions on the mailing list.

Kind of institution	Total number	Number receiving PHS research grant support	Percent
Academic institutions	400	379	94.7
Independent hospitals	310	185	59.6
Independent research institutions	240	230	95.9
State and local health departments	90	88	97.7
All other institutions	53	50	94.3
Totals	1,093	932	85.2

Table 3.1.1.4. HRF construction grant support to institutions on the mailing.

Kind of institution	Total number	Number receiving HRF construction grants	Percent
Academic institutions	400	187	46.7
Independent hospitals	310	123	39.7
Independent research institutions	240	54	22.5
State and local health departments	90	26	28.9
All other institutions	53	10	18.8
Totals	1,093	400	36.5

3.1.2. Survey questionnaire.

Consultation was held with faculty and administrative personnel at Johns Hopkins University and The University of Colorado during March and April to determine the kinds of data which could be obtained from their existing record systems. It was found that little uniformity between institutions could be expected in the kind of records kept or in the organization of these records.

The information needed from the survey was reviewed with these institutions and their suggestions on how it could be uniformly collected were obtained. The questionnaires were developed from these conferences and prepared for the pretest.

The questionnaire was designed in two parts, a Part A and B. Part A was to be completed by the central administration and solicited information on the institution's organizational structure. In addition, the name of the coordinator of the survey and the names of each person responsible for completing a Part B response were requested.

Part B of the questionnaire was designed to obtain information on the following:

1. Current status

What is the existing inventory of health-related research space among the non-profit institutions?

What is the condition of this space?

How many research workers are now working in this space?

What is the funding that is supporting the research activity in this space?

What part of this space was constructed with HRF assistance.

2. Current needs

How much space should be remodeled or replaced?

Is additional space needed to relieve overcrowding?

How much space is required per researcher?

3. Future needs

What are the requirements for new space and remodeling to meet the space demands in 1980?

Copies of the questionnaires are included in the Appendix.

3.1.3. Pretest of questionnaires.

The institutions listed below were contacted during April, 1968 and requested to cooperate in the pretest phase of the survey. These institutions were selected on the basis of their organizational structures and as being representative of the different types of institutions that would later be requested to respond. It was felt that any difficulties that would be encountered in completing the questionnaire would be brought out among this group.

<u>Pretest institutions</u>	<u>Reporting components</u>
Cornell University - New York	Medical school School of veterinary medicine Aggregate response for balance of research activities
University of Michigan	Dental school Medical school School of public health School of pharmacy Aggregate response for balance of research activities
University of Southern California	Dental school Medical school School of pharmacy Aggregate response for balance of research activities
New York State Department of Health	Division of Laboratories and Research Birth Defects Institute Roswell Park Memorial Institute

New Jersey Department of
Institutions and Agencies

University of California

Philadelphia General Hospital

Johnstone Training Center
Bureau Research of
Neurology and Psychiatry

A selection of their health-professional schools and the aggregate from the Berkeley campus.

One Part B response covering all health-related research.

A regional conference was held in New York on May 15, 1968 with all pretest institutions with the exception of the California schools. The questionnaire was reviewed carefully and several minor changes were incorporated.

The pretest institutions were requested to complete Part A within one week and Part B within four weeks. It was found that some institutions had data on space usage in machine readable form, while others, at the other extreme, would have to measure their facilities. Even those with machine readable space records had definitional problems in that some teaching space is also research space and allocations had to be made.

Personal visitations were made by an NIH-Westat team during July to each pretest institution to review its responses. Respondents were questioned about the data sources used and the difficulty of answering each question. Respondents were asked for suggestions on how the questionnaire could be improved to ease the task of responding. Definitions were reviewed very carefully to see if they were being interpreted and applied correctly.

After reviewing all pretest responses, the questionnaire was again revised and data requirements were simplified. Substantive changes were reviewed with the pretest institutions to make certain that the revised requirements could be met. The pretest results were documented and the survey questionnaires submitted to the Bureau of the Budget for clearance.

3. 1. 4. Survey management.

Following Bureau of the Budget clearance of the survey schedules and procedure, the questionnaires were printed and prepared for mailing. A package containing the questionnaires, a machine listing of the institutions' HRF construction grant awards, and return envelopes was directed to the president of each institution on the mailing list. A copy of the questionnaires and the letter of transmittal dated August 28, 1968 can be found in the Appendix.

The institutions were asked to respond according to the following schedule:

<u>Kind of Institution</u>	<u>Responses Requested</u>
<u>Educational Institutions</u>	One Part A from the central university administration; one Part B for each dental school, medical school, school of pharmacy, school of public health, school of veterinary medicine; and one aggregate Part B response for all other schools, colleges, institutes, laboratories, etc.
<u>Nonacademic Institutions</u>	
a. Independent hospital	One Part A and one Part B.
b. Nonacademic research institution	One Part A and one Part B.
c. State, County or City Department of Health or Mental Health or State Board	One Part A for <u>each</u> such department; one Part B for each institutional component (e.g., hospital or research laboratory) in which at least 5,000 net square feet of space are devoted to health-related research; and one Part B for the aggregate of all other components of the department.
d. Other institutions	One Part A and one Part B.

The institutions were asked to complete and return the Part A forms within two weeks. The Part A responses were reviewed carefully to determine if the instructions were interpreted correctly and if the institutions' planned Part B response provided for all components requiring separate responses. The completed Part A also contained the name of the survey coordinator who could be contacted later if Part B response was slow.

Part B responses were to be returned by the end of the sixth week (October 18, 1968). The follow-up activities included:

1. A letter was sent to all institutions that had not submitted a Part A response by September 24, 1968.
2. A night letter was sent to all institutions receiving over \$500, 000 in PHS research grants that had not submitted a Part A response by October 8, 1968.
3. On October 22, 1968 night letters were directed to all institutions receiving over \$70, 000 in research grants that had not returned Part A responses. Letters with additional questionnaires were sent to those institutions receiving under \$70, 000 at this same time.
4. On November 22, 1968, a letter was sent to all institutions receiving over \$70, 000 that had not submitted a complete response.
5. An extensive telephone follow-up was made in late December 1968 to those institutions that had health-professional schools or were large in terms of PHS research grant awards to urge them to complete their responses.

Tables 3.1.4.1. and 3.1.4.2. give data on survey response in terms of completed Parts A and B and dollars of PHS research grant support.

Table 3.1.4.1. Survey response, questionnaires A and B.

Kind of institution	Number of institutions	Part A response		Part B response	
		Number	%	Number	%
Academic institutions	400	370	92.5	263	65.8
Independent hospitals	310	260	83.9	182	58.7
Independent research institutions	240	209	87.1	145	60.4
State and local health departments	90	81	90.0	48	53.3
All other institutions	53	53	100.0	33	62.3
Totals	1,093	973	89.0	671	61.4

Table 3.1.4.2. Survey response. Public Health Service research grant support.

Kind of institution	PHS research grants (Thousands of dollars)			
	To institutions on the mailing list (Thousands)	To respondents Part A Thousands	To respondents Part A Percent	To respondents Part B Thousands
Academic institutions	\$535,169	\$533,167	99.6	\$529,182
Independent hospitals	63,714	63,178	99.2	60,949
Independent research institutions	53,660	52,688	98.2	48,245
State and local health departments	37,207	33,445	89.9	28,427
All other institutions	9,283	9,283	100.0	8,196
Totals	\$699,033	\$691,761	99.0	\$674,999
				96.6

3.1.5. Data handling.

3.1.5.1. Editing and coding.

Upon receipt, the questionnaires were identified and coded according to kind of institution and/or component and geographic location. The forms were reviewed carefully for completeness and internal consistency. Individual responses were coded where necessary to conform to the card record format.

Incomplete or missing responses were treated separately. A copy was made of the page(s) that were not complete and returned to the individual that completed the form. An accompanying note was sent explaining the deficiency and requesting that the response be changed on the copy and returned. The respondents were very cooperative in this effort, returning a high percentage of corrected copies.

Part B responses from institutions that reported some interrelationship with other institutions on ownership and use of research space were held back. The space reported as being used by the personnel of another institution, or as being used in another institution, was checked against that reported by the other institution. Wherever possible, discrepancies between responses were resolved by calling either or both respondents.

3.1.5.2. Computer edit and tabulation.

The responses were added to the data base in groups of 30 to 40 questionnaires to facilitate editing and correcting. The coded questionnaires were first keypunched and verified. An edit program was written to flag any discrepancies noted within or between certain data fields, and to write a magnetic tape record. The questionnaires that were flagged during the edit run were pulled and the data checked. Discrepancies were corrected on the next edit run by inserting appropriate change cards which corrected the tape record.

Programs were written to produce the tabulations desired from the edited tape record.

3.1.6. Evaluation of survey results.

An evaluation of this survey is difficult in that this was the first attempt to collect data on space used for health-related research. Other surveys of academic space usage have been made, but research space was never broken down by type of research activity and in many cases was not reported separately from teaching space.

The academic institutions were better prepared for this reporting requirement due to their experience in reporting space usage on the U.S. Office of Education, Higher Education General Information Survey (HEGIS). Even this group of respondents faced definitional problems due to the necessity for separating or allocating certain blocks of space used jointly for teaching and research. Space figures collected in earlier surveys could only be used for checking magnitudes due to this limitation.

Research space reported as being built or remodeled with assistance of the HRF construction program compared favorably in aggregate with HRF construction program records. Some differences existed between the two sources, on space in use and space under construction. These differences were accounted for by the time lag that exists between first occupancy of a building and the reporting and recording of construction completions.

Another means of evaluating the survey results was comparing NIH research and training grants made to the 100 largest academic institutions during FY 1967 with sponsored research expenditures reported by these same institutions in the survey. This means of evaluation is of limited validity in that respondents were not required to report for a specific period, such as FY 1967, but were asked to report for the most recent period for which data was available. In addition, respondents were asked for the annual expenditures of sponsored research which includes sources of research funds other than PHS research and training grants.

In aggregate, the 100 largest academic institutions reported 801 million dollars as total annual expenditures for sponsored health-related research and training activities. NIH reported research and research training grants of 549 million dollars or about 68% of the total for FY 1967 for these same institutions. This percentage of total institutional sponsored research expenditure checks out favorably with the 68.3% NIH sponsored to total federal support for extramural medical and health-related research reported for FY 1965 in Resources for Medical Research, Report No. 10, January 1967.

The principle difficulty in responding, as expressed by the institutions, was in determining the "health-relatedness" of various research activities. For certain classes of respondents, such as medical schools, this did not present a problem since 100% of the research activities are health-related. For others, particularly in the "other academic institutions" category, this did present a problem and some judgmental bias may have been brought into the survey results. A great deal of time was devoted to telephone conversations relating to this problem and many institutions called to ask whether or not certain research activities should be included.

To summarize, survey results checked out favorably against known established figures, wherever this checking could be made.

3.2. Supplementary tables.

TABLE

- 3.2.1. Ownership of respondent institutions.
- 3.2.2. Reported use of health-related research space owned by respondents.
- 3.2.3. Health-related research space used by respondents.
- 3.2.4. Reported health-related research space owned by respondents, by age of construction.
- 3.2.5. Reported age and condition of health-related research space.
- 3.2.6. Reported total health-related research space constructed since January 1957 and that space constructed with the assistance of the HRF construction program.
- 3.2.7. Reported total health-related research space which has been remodeled since January 1957 and that space remodeled with the assistance of the HRF construction program.
- 3.2.8. Reported health-related research space owned or rented by respondents which is used for the care and housing of animals by source of construction or remodeling assistance.
- 3.2.9. Reported additional nsf of H-R research space needed to relieve overcrowding of present H-R research staff.
- 3.2.10. Respondents 'best judgment' as to the percentage of H-R research space that needs to be remodeled per year, on the average, in order to maintain its effectiveness.
- 3.2.11. Reported annual expenditures for sponsored and other separately budgeted H-R research and research training.
- 3.2.12. Reported number of full-time and part-time personnel devoting at least part of their time to health-related research.

TABLE

- 3.2.13. Reported number of professional researchers engaged in H-R research in space owned by institutions other than the respondents, and the amount of space so used.
- 3.2.14. Reported amount of new H-R research space under construction or fully funded, the portion funded by the HRF construction program, and the portion to be used for care and housing of animals for research.
- 3.2.15. Reported amount of space being remodeled for H-R research use or for which remodeling is fully funded, the portion funded by the HRF construction program and the portion to be used for care and housing of animals for research.
- 3.2.16. Reported additional new construction and remodeling needed to meet projected 1980 health-related research space requirements, which is not presently under construction or fully funded.
- 3.2.17. Reported new construction requirements for 1980 and planned use of this space.
- 3.2.18. Reported remodeling requirements for 1980 and planned use of this space.

Table 3.2.1. Ownership of respondent institutions.

Kind of institution	Total respondents	Ownership			Private
		State	Public County	City	
Academic institutions	263	122	-	3	138
Independent hospitals	182	1	8	3	170
Independent research institutions	145	4	-	-	141
State and local health departments	48	35	8	5	-
All other institutions	33	3	-	-	30
Totals	671	165	16	11	479

Table 3.2.2. Reported use of health-related research space owned by respondents.

Kind of institution	Space owned by respondents			Total space owned by respondents
	Used by respondents	Used by another institution	Number of respondents	
	Number of respondents	Thousands of net square feet	Thousands of net square feet	
Academic institutions				
Dental schools	44	620	1	4
Medical schools	98	13,784	5	20
Schools of pharmacy	61	713	1	1
Schools of public health	12	450	1	4
Schools of veterinary medicine	17	1,294	1	3
Other academic institutions	224	13,171	15	82
Independent hospitals	162	2,273	53	1,156
Independent research institutions	94	2,229	15	163
State and local health	109	1,619	28	249
All other institutions	25	377	-	-
Totals	846	36,530	120	1,682
				38,212

Table 3.2.3. Health-related research space used by respondents.

Kind of institution	Space used by respondents			Rented	Total
	Owned by respondents	Owned by another institution	Number of respondents		
	Thousands of net square feet				
Academic institutions					
Dental schools	44	620	12	9	40
Medical schools	98	13,784	73	41	502
Schools of pharmacy	61	713	6	1	2
Schools of public health	12	450	7	8	73
Schools of veterinary medicine	17	1,294	1	-	-
Other academic institutions	224	13,171	39	100	27
Independent hospitals	162	2,273	13	60	15
Independent research institutions	94	2,229	34	238	54
State and local health departments	109	1,619	16	127	19
All other institutions	25	377	6	41	8
Totals	846	36,530	207	3,711*	182
					7
					1,234
					41,475
					425

119

* 1,682 thousand nsf is owned by reporting institutions. The remainder, 2,029 thousand nsf, is owned by nonrespondents such as Federal hospitals and institutions not in the survey or not responding.

Table 3.2.4. Reported health-related research space owned by respondents, by age of construction.

Kind of institution	Total owned space	Construction completed prior to 1940	Construction completed between Jan. 1940 and Jan. 1957	Construction completed since Jan. 1957	Age not reported
Academic institutions			(Thousands of nsf)		
Dental schools	624	181	187	256	-
Medical schools	13,804	3,026	2,878	7,900	-
Schools of pharmacy	714	153	117	444	-
Schools of public health	454	100	109	245	-
Schools of veterinary medicine	1,297	182	225	503	387
Other academic institutions	13,253	3,907	2,507	6,805	33
Independent hospitals	3,429	964	519	1,927	20
Independent research institutions	2,391	323	528	1,540	-
State and local health departments	1,868	503	523	761	81
All other institutions	377	164	120	93	-
Totals	38,211	9,503	7,713	20,474	521

Table 3.2.5. Reported age and condition of health-related research space.

Age and condition	Academic institutions			
	Total academic	Dental schools	Medical schools	Schools of pharmacy
(Thousands of net square feet)				
Constructed prior to 1940				
Satisfactory condition	3,039	127	1,099	92
Should be remodeled	2,659	22	1,199	34
Should be replaced	1,852	31	728	27
Condition not reported	-	-	-	-
Subtotal	7,549	181	3,026	153
Constructed between 1/1940 and 1/1957				
Satisfactory condition	3,658	169	1,751	89
Should be remodeled	1,430	14	644	13
Should be replaced	744	3	293	16
Condition not reported	189	-	189	-
Subtotal	6,022	187	2,877	118
Constructed since 1/1957				
Satisfactory condition	14,709	230	7,174	419
Should be remodeled	1,257	13	692	22
Should be replaced	188	13	34	2
Condition not reported	-	-	-	-
Subtotal	16,153	256	7,900	443
Age not reported				
Satisfactory condition	305	-	-	-
Should be remodeled	75	-	-	-
Should be replaced	40	-	-	-
Condition not reported	-	-	-	-
Subtotal	419	-	-	-
Total				
Satisfactory condition	21,710	526	10,024	600
Should be remodeled	5,419	50	2,535	69
Should be replaced	2,826	47	1,055	45
Condition not reported	189	-	189	-
Total	30,145	624	13,804	714

First of three pages

Table 3.2.5. Reported age and condition of health-related research space (continued).

Age and condition	Academic institutions			Independent hospitals
	Schools of public health	Schools of veterinary medicine	Other academic institutions	
(Thousands of net square feet)				
Constructed prior to 1940				
Satisfactory condition	2	48	1,671	487
Should be remodeled	69	64	1,271	127
Should be replaced	30	71	965	332
Condition not reported	-	-	-	17
Subtotal	100	182	3,907	964
Constructed between 1/1940 and 1/1957				
Satisfactory condition	78	86	1,485	230
Should be remodeled	11	43	705	238
Should be replaced	20	96	316	50
Condition not reported	-	-	-	1
Subtotal	109	225	2,506	518
Constructed since 1/1957				
Satisfactory condition	241	414	6,231	1,807
Should be remodeled	3	45	482	92
Should be replaced	1	45	93	28
Condition not reported	-	-	-	-
Subtotal	245	503	6,806	1,927
Age not reported				
Satisfactory condition	-	272	33	3
Should be remodeled	-	75	-	6
Should be replaced	-	40	-	-
Condition not reported	-	-	-	10
Subtotal	-	386	33	19
Total				
Satisfactory condition	321	819	9,420	2,527
Should be remodeled	82	225	2,458	463
Should be replaced	52	252	1,375	410
Condition not reported	-	-	-	28
Total	454	1,296	13,253	3,428

Second of three pages

Table 3.2.5. Reported age and condition of health-related research space (continued).

Age and condition	Independent research institutions	State and local health departments	All other institutions	Total
(Thousands of net square feet)				
Constructed prior to 1940				
Satisfactory condition	165	151	59	3,901
Should be remodeled	75	125	71	3,057
Should be replaced	83	227	35	2,529
Condition not reported	-	-	-	17
Subtotal	323	503	165	9,504
Constructed between 1/1940 and 1/1957				
Satisfactory condition	426	376	108	4,798
Should be remodeled	43	89	11	1,811
Should be replaced	59	58	1	912
Condition not reported	-	-	-	190
Subtotal	528	523	120	7,712
Constructed since 1/1957				
Satisfactory condition	1,394	704	87	18,701
Should be remodeled	120	40	5	1,514
Should be replaced	28	19	1	264
Condition not reported	-	-	-	-
Subtotal	1,541	763	93	20,479
Age not reported				
Satisfactory condition	-	81	-	389
Should be remodeled	-	-	-	81
Should be replaced	-	-	-	40
Condition not reported	-	-	-	10
Subtotal	-	81	-	520
Total				
Satisfactory condition	1,984	1,312	255	27,787
Should be remodeled	238	254	86	6,463
Should be replaced	170	304	36	3,745
Condition not reported	-	-	-	217
Total	2,392	1,870	377	38,212

Third of three pages

Table 3.2.6. Reported total health-related research space constructed since January 1957 and that space constructed with the assistance of the HRF construction program.

Kind of institution	Amount of NEW space constructed since January 1957				
	Total		Amount constructed with the assistance of the HRF construction program		
	Number of institutions	nsf of H-R research space	Number of institutions	nsf of H-R research space	% of total
		(Thousands)		(Thousands)	
Academic institutions					
Dental schools	44	256	20	154	60.2
Medical schools	98	7,900	86	6,208	78.6
Schools of pharmacy	61	443	18	225	50.8
Schools of public health	12	245	6	228	93.1
Schools of veterinary medicine	17	503	11	208	41.4
Other academic institutions	224	6,806	103	3,213	47.2
Independent hospitals	182	1,927	71	1,261	65.4
Independent research institutions	95	1,541	36	847	55.0
State and local health departments	117	761	23	317	41.7
All other institutions	25	93	8	44	47.3
Totals	875	20,475	382	12,705	62.1

Table 3.2.7. Reported total health-related research space which has been remodeled since January 1957 and that space remodeled with the assistance of the HRF construction program.

Kind of institution	Health-related research space remodeled since January 1957				
	Total		Amount remodeled with the assistance of the HRF construction program		
	Number of institutions	nsf of H-R research space (Thousands)	Number of institutions	nsf of H-R research space (Thousands)	% of total
Academic institutions					
Dental schools	39	164	12	69	42.1
Medical schools	82	2,903	38	901	31.0
Schools of pharmacy	27	140	5	39	27.9
Schools of public health	9	23	-	-	-
Schools of veterinary medicine	13	274	5	31	11.3
Other academic institutions	164	2,452	46	329	13.4
Independent hospitals	122	962	42	250	26.0
Independent research institutions	64	531	14	135	25.4
State and local health departments	69	510	10	83	16.3
All other institutions	11	112	4	23	20.5
Totals	600	8,071	176	1,860	23.0

Table 3.2.8. Reported health-related research space owned or rented by respondents which is used for the care and housing of animals by source of construction or remodeling assistance.

Kind of institution	Number of institutions reporting	Amount of space used for care and housing of animals		
		Total	Amount constructed or remodeled with HRF assistance	Amount constructed or remodeled without HRF assistance
(Thousands of net square feet)				
Academic institutions				
Dental schools	32	57	33	24
Medical schools	94	1,814	904	910
Schools of pharmacy	46	44	17	27
Schools of public health	8	43	22	21
Schools of veterinary medicine	15	387	109	278
Other academic institutions	195	1,242	264	978
Independent hospitals	134	414	153	261
Independent research institutions	78	425	206	219
State and local health departments	62	203	90	113
All other institutions	8	54	16	38
Totals	672	4,683	1,814	2,869

Table 3.2.9. Reported additional nsf of H-R research space needed to relieve overcrowding of present H-R research staff.

Kind of institution	Number of institutions reporting needs	H-R research space being used by present H-R research staff	Additional space needed to relieve overcrowding
(Thousands of net square feet)			
Academic institutions			
Dental schools	36	638	487
Medical schools	81	15,558	5,779
Schools of pharmacy	44	652	330
Schools of public health	9	449	193
Schools of veterinary medicine	15	1,171	752
Other academic institutions	175	12,401	4,747
Independent hospitals	95	2,149	1,049
Independent research institutions	68	2,589	608
State and local health departments	47	1,493	717
All other institutions	18	425	141
Totals	588	37,525	14,803

Table 3.2.10. Respondents 'best judgment' as to the percentage of H-R research space that needs to be remodeled per year, on the average, in order to maintain its effectiveness.

Kind of institution	Total number of respondents	Number estimating each percentage class									
		Less than 2.5%	2.5- 7.49	7.5- 12.49	12.5- 17.49	17.5- 22.49	22.5- 27.49	27.5- 32.49	32.5- 37.49	37.5- 42.49	42.5- 47.49
Academic institutions											
Dental schools	46	3	9	22	4	6	-	1	-	1	-
Medical schools	92	3	26	37	13	11	1	-	-	-	-
Schools of pharmacy	59	8	15	24	1	5	3	-	-	-	1
Schools of public health	11	-	3	2	2	4	-	-	-	-	-
Schools of veterinary medicine	16	-	6	6	-	3	1	-	-	-	-
Other academic institutions	199	6	39	89	26	26	6	1	2	-	1
Independent hospitals	154	17	30	56	14	25	9	-	1	-	2
Independent research institutions	125	24	19	52	11	15	2	-	1	-	1
State and local health departments	115	24	20	37	10	12	7	3	1	-	1
All other institutions	24	7	4	6	4	3	-	-	-	-	-
Totals	841	92	171	331	85	110	29	6	6	1	-
										6	4

Table 3.2.11. Reported annual expenditures for sponsored and other separately budgeted H-R research and research training.

Kind of institution	Total		Sponsored H-R research		Separately budgeted H-R research	
	Number of institutions reporting	Annual expenditures	Number of institutions reporting	Annual expenditures	Number of institutions reporting	Annual expenditures
(Thousands)						
Academic institutions						
Dental schools	46	\$ 18,196	46	\$ 17,212	25	\$ 984
Medical schools	98	594,312	95	542,984	55	51,328
Schools of pharmacy	57	9,263	55	7,592	45	1,671
Schools of public health	13	24,963	11	17,638	7	7,325
Schools of veterinary medicine	17	19,536	17	15,179	13	4,357
Other academic institutions	216	289,552	212	213,074	142	76,478
Independent hospitals	168	123,044	161	102,792	105	20,252
Independent research institutions	141	106,654	141	84,337	90	22,317
State and local health departments	117	66,284	104	38,937	78	27,347
All other institutions	32	17,369	29	10,780	15	6,589
Totals	905	\$1,269,173	871	\$1,050,525	575	\$218,648

Table 3.2.12. Reported number of full-time and part-time personnel devoting at least part of their time to health-related research.

Kind of institution	Employment category					
	Totals		Professional staff		Postdoctoral research fellows and trainees	
	Full-time*	Part-time	Full-time*	Part-time	Full-time*	Part-time
Academic institutions						
Dental schools	3,005	1,131	1,059	472	241	91
Medical schools	69,272	16,271	20,068	7,720	5,632	1,074
Schools of pharmacy	2,357	909	774	101	122	6
Schools of public health	2,479	1,162	842	430	88	31
Schools of veterinary medicine	3,046	891	892	181	209	19
Other academic institutions	38,319	20,402	12,081	2,459	2,406	299
Independent hospitals	10,045	2,794	2,803	1,281	1,171	104
Independent research institutions	8,428	1,766	2,631	679	482	46
State and local health departments	6,150	2,003	2,307	440	111	71
All other institutions	1,314	481	396	311	114	81
Totals	144,415	47,810	43,853	14,074	10,576	1,822

*Full-time pertains only to employment status and not to amount of time engaged in H-R research.

First of two pages

Table 3.2.12. Reported number of full-time and part-time personnel devoting at least part of their time to health-related research(continued).

Kind of institution	Employment category					
	Graduate students		Unspecified		All others	
	Full-time*	Part-time	Full-time*	Part-time	Full-time*	Part-time
Academic institutions						
Dental schools	568	279	-	-	1,137	28
Medical schools	7,191	1,557	639	196	35,742	5,72
Schools of pharmacy	1,011	549	-	-	450	25
Schools of public health	438	287	-	-	1,111	41
Schools of veterinary medicine	704	322	-	-	1,241	36
Other academic institutions	12,286	11,368	-	100	11,546	6,17
Independent hospitals	222	153	-	-	5,849	1,25
Independent research institutions	210	86	-	-	5,105	95
State and local health departments	256	259	-	-	3,476	1,23
All other institutions	39	19	-	-	765	7
Totals	22,925	14,879	639	296	66,422	16,73

*Full-time pertains only to employment status and not to amount of time engaged in H-R research.

Second of two pages

Table 3.2.13. Reported number of professional researchers engaged in H-R research in space owned by institutions other than the respondents, and the amount of space so used,

Kind of institution	Number of respondent institutions		Nsf of H-R research space used in institutions other than respondents (Thousands)	Number of professional researchers using this space
	Total	Using space in other institutions		
Academic institutions				
Dental schools	50	12	21	57
Medical schools	100	73	3,092	6,700
Schools of pharmacy	63	6	13	34
Schools of public health	13	7	19	64
Schools of veterinary medicine	17	1	-	-
Other academic institutions	227	39	100	230
Independent hospitals	182	13	60	205
Independent research institutions	145	34	238	480
State and local health departments	128	16	127	172
All other institutions	33	6	41	143
Totals	958	207	3,711*	8,085

* 1,682 thousand nsf is owned by reporting institutions. The remainder, 2,029 thousand nsf, is owned by nonrespondents such as Federal hospitals and institutions not in the survey or not responding.

Table 3.2.14. Reported amount of new H-R research space under construction or fully funded, the portion funded by the HRF construction program, and the portion to be used for care and housing of animals for research.

Kind of institution	Number of reporting institutions	Nsf of H-R research space under construction or fully funded		
		Total nsf (Thousands)	Being built or to be built with assistance of the HRF Construction Program (Thousands)	To be used for the care and housing of animals for H-R research (Thousands)
Academic institutions				
Dental schools	17	328	186	29
Medical schools	66	3,924	2,583	563
Schools of pharmacy	11	128	59	6
Schools of public health	2	71	66	2
Schools of veterinary medicine	5	165	135	99
Other academic institutions	80	2,871	350	292
Independent hospitals	33	620	399	86
Independent research institutions	12	175	40	12
State and local health departments	13	301	39	35
All other institutions	3	4	2	1
Totals	242	8,587	3,859	1,125

Table 3.2.15. Reported amount of space being remodeled for H-R research use or for which remodeling is fully funded, the portion funded by the HRF construction program and the portion to be used for care and housing of animals for research.

Kind of institution	Number of reporting institutions	Nsf of H-R research space being remodeled or for which remodeling is fully funded		(Thousands) (Thousands)
		Total nsf	Being remodeled or to be remodeled with assistance of the HRF Construction Program	
Academic institutions				
Dental schools	3	2	-	-
Medical schools	54	699	364	80
Schools of pharmacy	11	25	-	5
Schools of public health	2	26	7	-
Schools of veterinary medicine	8	53	-	17
Other academic institutions	60	422	26	38
Independent hospitals	38	151	73	33
Independent research institutions	24	96	13	13
State and local health departments	13	47	2	5
All other institutions	3	19	9	8
Totals	216	1,540	494	199

Table 3.2.16. Reported additional new construction and remodeling needed to meet projected 1980 health-related research space requirements, which is not presently under construction or fully funded.

Kind of institution	Number of institutions reporting	Total additional nsf of H-R research space required		Amount of total space required for care and housing of animals	
		New construction	Remodeling	New construction	Remodeling
(Thousands of net square feet)					
Academic institutions					
Dental schools	45	1,732		179	183
Medical schools	95	20,728		7,591	2,254
Schools of pharmacy	57	1,331		259	5
Schools of public health	10	731		176	648
Schools of veterinary medicine	17	2,286		833	13
Other academic institutions	199	20,120		5,155	107
				1,949	17
Independent hospitals	127	3,236		1,355	46
Independent research institutions	91	2,243		925	460
State and local health departments	75	1,754		766	209
All other institutions	15	245		83	55
Totals	731	54,406		17,322	6,338
					1,370

Table 3.2.17. Reported new construction requirements for 1980 and planned use of this space.

Kind of institution	Number of institutions	New construction needed to meet projected H-R research space requirements for 1980	Planned use of space		
			Needed for expanding existing H-R research programs	Needed for new H-R research programs	Other
(Thousands of net square feet)					
Academic institutions					
Dental schools	42	1,732	421	631	680
Medical schools	94	20,728	5,130	6,896	8,702
Schools of pharmacy	48	1,331	393	240	698
Schools of public health	10	731	281	155	295
Schools of veterinary medicine	17	2,286	770	975	541
Other academic institutions	189	20,120	6,164	4,534	9,422
Independent hospitals	111	3,236	651	1,017	1,568
Independent research institutions	80	2,243	741	638	864
State and local health departments	60	1,754	706	296	752
All other institutions	12	245	35	35	175
Totals	663	54,406	15,292	15,417	23,697

Table 3.2.18. Reported remodeling requirements for 1980 and planned use of this space.

Kind of institution	Number of institutions	Remodeling needed to meet projected H-R research space requirements for 1980	Planned use of space		
			(Thousands of net square feet)	Needed for Expanding existing H-R research programs	Needed for new H-R research programs
Academic institutions					
Dental schools	27	179	47	51	81
Medical schools	80	7,591	1,803	1,390	4,398
Schools of pharmacy	31	259	52	29	178
Schools of public health	7	176	12	57	107
Schools of veterinary medicine	16	833	199	67	567
Other academic institutions	152	5,155	1,245	589	3,321
Independent hospitals	85	1,355	242	220	893
Independent research institutions	53	925	220	170	535
State and local health departments	46	766	103	31	632
All other institutions	9	83	19	9	55
Totals	506	17,322	3,942	2,613	10,767

3.3. Medical school comments to item 34 of the questionnaire.

[What institutional programs would be most seriously affected if the additional construction and remodeling reported on line 29 were not done?]

1. Cardiovascular, cancer, diabetes, nutrition and metabolism optometry, public health, biophysical science.
2. All
3. Research in the basic sciences.
4. Replace temporary buildings with permanent buildings.
5. Accreditation status would be in jeopardy; entire academic program with particular emphasis upon the sciences basic to medicine would be seriously affected.
6. A proposed cardiovascular research and training program.
7. All programs currently contemplated. This is a new and developing school and cessation of the building program would mean that our growth had been stopped before we had become a fully developed and fully functioning institution.
8. Animal care facility, basic science research facility.
9. Basic medical science program would be most seriously affected.
10. Surgery, obstetrics, gynecology, psychology and behavioral sciences.
11. Newer programs.
12. Not possible to predict.
13. Research activities would virtually cease.
14. Research lab and recruitment of teaching facility.
Opening of a dental school.
15. Impossible to project what programs. A general curtailment of any additional research efforts of the medical school.

16. Nearly every program. However, the clinical departments programs would be in more jeopardy than the basic sciences.
17. Research by clinical faculty. Attract suitable faculty members.
18. Development of existing and new programs of instruction and research in the basic sciences and expansion or research in clinical areas.
19. Institutional programs would be nearly equally affected. The entire medical and biological research program of the University and the teaching program as well, are vitally dependent on the accomplishment of construction and remodeling noted herein to provide adequate facilities.
20. Undergraduate, graduate, resident, and all other training programs would be adversely affected by inability to attract and maintain faculty. Research programs affected are: organ transplant, bio-engineering, genetics, clinical pharmacology, community health, child neurology, physiology and psychiatry, research in brain function.
21. Basic clinical research, research in basic biological sciences, health-related research in biology and chemistry.
22. The Heart Research Center Program. The child growth and development program, the biophysics program, the surgical research program.
23. The medical school is in planned expansion and lack of research space will seriously hamper recruitment of faculty and will adversely affect all research service and educational programs.
24. Rapidly expanding collaborative research between basic and clinical scientists; examples are clinical pharmacology, genetics, immunology, etc. Health care research of various kinds, just now getting established.
25. Clinical faculty research.
26. If we do not get this new construction and remodeling, the school will be so seriously affected that all programs will drift away.

27. Expansion of our medical students by 33% and predoctoral students by 67%; development of a Biomedical Engineering Program; Research Center for the Ageing and Development; environmental health, air pollution, etc.
28. Research, teaching, administrative.
29. All teaching and research programs would be seriously affected.
30. All
31. Direct patient research and clinically applied relevant basic research.
32. Current enrollment of 130 freshman students will nearly double to 208 by 1970, when the new Basic Science Building will be completed. Curtailment of construction program's making overall expansion possible would mean admission of less applicants than planned. Also, more students require more faculty who will need more space for teaching and research. If concomitant expansion in research space does not take place, the standard of the school can not be kept up to par.
33. All institutional programs would be seriously affected.
34. The school of medicine is still developing as a four-year school. The projections its faculty has made for all programs would be jeopardized.
35. All basic science and clinical research programs would be impeded to a marked degree.
36. The medical school needs to increase the faculty by at least 50 members and in order to do so, must provide additional research areas for these new faculty members.
37. Additional expansion and new H-R research programs; present and future clinical and basic research, and academic program.
38. Faculty recruitment program would be curtailed.
39. Recruitment and maintenance of strong faculty, development of attitude of scientific inquiry at all levels, research productivity related to regional and national needs.

40. Clinical research programs.
41. Primarily, clinical department research programs; to a lesser extent, basic medical sciences research programs.
42. The general research program of all departments, the development of new research programs in genetics, neurobiology, use of computer in medical research and research in patterns of medical care.
43. Since we believe that excellence in research and education are mutually supportive, any failure to create and maintain the most effective research facility possible results in deterioration of the educational program.
44. Those to develop biomedical sciences that serve as an overall foundation for all clinical investigation, allied health services programs which will improve delivery of medical care, and those to expand undergraduate and graduate medical programs.
45. Health Sciences Center, as presently conceived, would not be possible.
46. Research in the cancer, heart diseases, and stroke fields, and in the basic sciences.
47. The institution has currently been recruiting for six vacant department chairmanships. Although four have been recruited, candidates for the departments of surgery and medicine have declined, primarily for the lack of adequate research facilities.
48. Graduate education and research.
49. All programs would be affected. Increased student enrollment, retention of incumbent faculty presently in temporary make-shift quarters, recruitment of additional faculty required in both clinical and basic science departments.
50. Research in physics, chemistry, behavioral and social sciences is of increasing importance to a medical school such as ours. Clinical research would be restricted and hampered. Research space will be essential for additional teaching faculty who would be needed for increased medical school enrollment.

51. Insufficient space to answer specifically. Appropriate expansion of existing programs and development of new programs would both be affected by the necessity for selective choices between these aspects of the institution's growth and development.
52. This school is programming an expansion from 75 students per entering class, to 100 in 1970; 120 in 1973; 160 in 1975; and will consider to 200 in 1980. New space is needed for expanding faculty and, of course, expanding programs. Without needed space expansion plans will suffer.
53. Ability to recruit faculty needed to expand educational programs. Ability to expand established potential in multidiscipline research in the neurological sciences and in oncology.
54. All the basic sciences and all the clinical sciences with the exception of pediatrics.
55. Animal related research.
56. Graduate education.
57. All programs would be affected by the inability of the institution to provide space for increased faculty needed to perform instruction in the basic sciences and care of patients.
58. Needed expansion of our pre-clinical departments. We have tended to overexpand in the clinical areas in recent years. If we are to increase our student population, new facilities, of course, are necessary.
59. Clinical research, graduate training, postdoctoral research and training.
60. Expansion of graduate and medical student teaching in basic sciences, clinical research in hospital, animal care for all departments, new program in cellular pharmacology and toxicology.
61. Clinical research programs of a projected interdisciplinary clinical research center.

62. The following departments would be short in square footage: biochemistry, anatomy, microbiology, pharmacology, physiology, behavioral science, human genetics, biophysical sciences, neurobiology, immunology, animal facilities, research administration.
63. It will be increasingly difficult to recruit and maintain vitally needed members of the faculty and in consequence all programs of the institution would be severely affected.
64. Graduate training in basic sciences will remain at the 1968 level or be reduced. No new areas of research can be established nor can established projects or pilot projects be expanded at all. The professional schools will be unable to attract or hold faculty of high caliber and thus the total educational effort will become stagnant.
65. Development of faculty capability through research and graduate student training. Secondary effect would be a weakened teaching program for medical students due to lack of vital faculty and facilities.
66. Adequate research development of the following departments: physiology, pharmacology, biochemistry, microbiology, pathology, medicine, surgery, neurology, psychiatry, and ophthalmology. Also, animal care program, audiovisual program and instrument division.
67. The planned expansion of MD and PhD programs depends upon these facilities. The recruitment of new faculty to handle staff programs and the expansion of HR research in both clinical and pre-clinical areas.
68. We would not be able to increase the number of MD graduates which the country needs and we are planning to educate.
69. Severely limit the expansion of existing research programs in microbiology and pharmacology. Prevent development of new research programs, particularly in biomedical engineering and marine biology. Since a considerable portion of the proposed Children's Hospital would be dedicated to research, non-availability of funds would prevent construction of this building.

70. Research in clinical sciences would be hurt most seriously, such as proposed projects in nutrition, tumor virology, wound healing, transplantation, immunology, fetal physiology, broad research projects related to genetics, cell biology, enzymology, the neurosciences and so forth, involving basic and clinical sciences.
71. Virtually all departments would be adversely affected. Programs not now receiving adequate (or any) attention would be affected most seriously, such as dermatology, ophthalmology, neuroanatomy, neuropathology, cardiovascular research and training, etc.
72. No one area can be singled out, as every effort will be made to maintain a satisfactory balance between programs. The whole research effort of the institution (college) would be held back.
73. All programs would be seriously retarded; most affected would be surgery, medicine, pediatrics, obstetrics and gynecology, pathology, and radiology.
74. Research and teaching programs of the clinical faculty.
75. The school of medicine would be unable to significantly expand any present program, and would be unable to add any new programs. The ability to expand the output of the educational programs will depend upon the provision of research facilities for new faculty.
76. The Regional Medical Center of which the School of Medicine will be a part.
77. Affiliated hospitals.
78. The entire research program will be adversely affected if the proposed new construction cannot be accomplished by 1980.
79. Basic science research.
80. All HR research because of interrelationship of departments, but in particular, radiation sciences, cardiovascular, pharmacology, toxicology, bioengineering.
81. Pathology, medicine, surgery, obstetrics-gynecology, psychiatry, pediatrics, radiology, and animal use for all programs in the medical school.

82. New medical school.
83. Clinical research programs.
84. We must, to become a complete medical school, have beds containing patients from which we can teach medicine, surgery, psychiatry, etc. In order to do this we must attract faculties in the clinical departments, and in order to attract such people we must provide for them adequate research space to permit them to function as creative physicians and scientists. For these reasons, our entire program is totally dependent upon additional construction of research space, since the research space presently available to us will barely accommodate the needs of our basic science faculties and will certainly not satisfy even the rudimentary needs of our clinical sciences.
85. Our basic research programs in anatomy, biochemistry, microbiology and physiology which require animals.
86. Our new medical school could not exist and develop without the major portion of this space.

APPENDIX



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE

NATIONAL INSTITUTES OF HEALTH
BETHESDA, MD 20014
AREA CODE 301 TEL: 656-4000

August 28, 1968

MEMORANDUM

TO : Heads of All Institutions Conducting Research in the Sciences
 : Related to Health

FROM : Director, National Institutes of Health

SUBJECT: Survey of Health Research Facilities

I would appreciate your cooperation in supplying information for a national survey of Health Research Facilities which is being undertaken by the National Institutes of Health. We need the information to support future requests for Federal funds for health research facilities to meet the requirements of the national biomedical community.

I know you are aware that the National Institutes of Health has been concerned formally for twelve years with the quantity and quality of the facilities available throughout the country for the conduct of research in the sciences related to health. This formal concern stems, of course, from our responsibility for administering the Health Research Facilities Construction Program, which was originally authorized by Congress in 1956 and which is still in operation. Since the program's inception we have awarded approximately \$500 million in matching grants for construction and equipment to over 400 institutions in every state of the Nation. For your use in completing the questionnaire, a list of construction grants (if any) awarded to your institution is enclosed.

Since the National Institutes of Health is the primary Federal source for health research facility funds, the biomedical research community has come to depend heavily upon this program. It is obviously important that in planning for future requirements we be as realistic as possible. Since this requires access to much more data about the community we support than are currently available to us, we have undertaken this survey. Our objectives are to obtain a national inventory of facilities currently being used for biomedical research, its condition, the number of people working in the space, and the estimated future needs for new

construction and remodeling to meet the projected requirements and circumstances of the biomedical research community. Accordingly, we have contracted with Westat Research, Inc. of Bethesda, Maryland, to conduct the survey to obtain this data for us.

The information submitted by your institution will be treated as confidential and will not be released or published without your permission except in aggregated statistical form. A copy of the published report will be mailed to each responding institution.

The enclosed survey is in two parts. Part A, Blue Form, to be completed by your institution's central administrative office, requests general information and the assignment of a survey coordinator for your institution's response(s). Part A takes little time to execute. We would appreciate your returning it in a few days. Part B, White Form, is the main questionnaire. It is to be prepared by the respondents specified under General Instruction, page 2, of Part B. These forms should be returned by October 18, 1968.

We have never before undertaken a national survey of health research facilities. I am well aware of the substantial effort required to fill out Part B. We, therefore, have undertaken this survey reluctantly, and only after concluding that the information is not obtainable any other way.

Sincerely yours,


James A. Shannon, M.D.
Director

Enclosures:

Questionnaires
List of HRF Grants (where applicable)

September 24, 1968

MEMORANDUM

To: Heads of All Institutions Conducting Research in the Sciences
Related to Health

From: James M. Daley
Assistant Project Director
Westat Research, Inc.
7979 Old Georgetown Road
Bethesda, Maryland 20014

Subject: Survey of Health Research Facilities

It is in the interest of the national biomedical research community that as many institutions as possible support this survey effort. Future requests for Federal funds and responsive program management must be based upon knowledge of the existing research facilities and projected space requirements.

The survey questionnaire forms were mailed to your institution on September 6, 1968 and specified due dates of September 18, 1968 for Part A and October 18, 1968 for Part B. To date we have not received Part A of the survey form from your institution.

Would you please forward Part A immediately or advise us if an additional delay is anticipated? If Part A has already been mailed to us, please disregard this reminder.



Westat Research, Inc.
7979 Old Georgetown Road
Bethesda, Maryland 20014
Telephone 301-652-9246

NIGHT LETTER

October 8, 1968

Reference: National Institutes of Health "Survey of Health Research Facilities"

Part A of the above referenced Survey, due September 18, 1968, has not been received from your institution. Information urgently needed for the final report. Please advise if forms are needed by you. Reply requested collect.

James M. Daley
Assistant Project Director
7979 Old Georgetown Rd.
Bethesda, Md. 20014



October 21, 1968

TELEGRAM

Subject: National Institutes of Health "Survey of Health Research Facilities"

Your cooperation on this survey is earnestly solicited. The due date for Part B is extended to November 15, 1968. If forms are needed, call Mr. Daley 301-657-9170 collect.

James M. Daley
Westat Research, Inc.
7979 Old Georgetown Rd.
Bethesda, Md. 20014

This will be sent to 65 institutions receiving over \$70,000 in grants.

Westat Research, Inc.
7979 Old Georgetown Road
Bethesda, Maryland 20014
Telephone 301-652-9246

October 23, 1968

MEMORANDUM

To: Heads of All Institutions Conducting Research in the Sciences
Related to Health

From: James M. Daley
Assistant Project Director
Westat Research, Inc.
7979 Old Georgetown Road
Bethesda, Maryland 20014
Telephone (301) 657-9170

Subject: National Institutes of Health "Survey of Health Research Facilities"

Your institution was selected for participation in the survey from the list of Public Health Service Research Grant recipients for fiscal year 1967. The information requested from each institution contacted is urgently needed for planning and management of the Health Research Facilities Construction Program.

There is still time for your institution to participate in this very essential survey. The due date for Part B has been extended to November 15 to provide additional time for preparation of the responses.

Institutions requested to participate in this survey have sensed the real need for the data requested and the potential long-range effect the survey results could have on their research programs. This is reflected by the 98% response rate of the 200 largest institutions (as measured by Public Health Service research grant support).

Enclosed are survey questionnaire forms and a memorandum from Dr. Shannon, Director, National Institutes of Health, outlining the purpose and need for the survey. Also enclosed is a memorandum circulated among the membership of the Council of Teaching Hospitals urging member institutions to participate.

Part A takes little time to complete. We are looking forward to receiving it from you in the very near future.





DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE

NATIONAL INSTITUTES OF HEALTH
BETHESDA, MD. 20014
AREA CODE 301 TEL: 656-4000

November 22, 1968

I would appreciate your personal assistance in expediting your institution's response to our Health Research Facilities Survey questionnaire. The questionnaire was mailed early in September. Although the response was due October 18, we have not yet received it. (A copy of the original letter of transmittal is attached for your information.)

This survey is very important to the NIH and to all institutions conducting biomedical research and research training. We need the information to support future budget requests for health research facilities. Unless we can base our requests on the kind of solid information this survey is designed to produce, we may not be successful in obtaining sufficient funds to meet more than a small portion of the country's most urgent needs for health research facilities.

Since your institution received \$ from the NIH in Fiscal Year 1967, I feel sure you understand our concern. We must receive the requested data not later than December 13.

I would appreciate your cooperation in this matter.

Sincerely yours,

John F. Sherman
John F. Sherman, Ph.D.
Deputy Director

Enclosure

Department of Health, Education, and Welfare
Public Health Service
National Institutes of Health
Health Research Facilities Branch

SURVEY OF HEALTH-RELATED RESEARCH
FACILITIES IN THE NONPROFIT SECTOR

September 1968

(To be completed by respondent)

Name of Institution _____

Address _____
(Street)

(City) (State) (Zip)

PART A - SECTION I - PRELIMINARY REPORT

General Instructions

Does your institution conduct health-related research in space allocated primarily for this purpose?
(See definition of health-related research on page 2 of Part B (white form).)

Yes

No

If "no", the institution receiving this survey form need complete only items 1 and 2 below, and return Parts A and B (blue and white forms) to the National Institutes of Health. If "yes", the institution is requested to take the following steps:

- a. Assign an overall coordinator for institution's response(s) to this survey.
- b. Complete Section I (this section) and return it in the enclosed envelope.
- c. Distribute copies of Part B (white form) to all persons named later in this section who are responsible for preparing the survey reports for specific organizational units.
- d. Coordinate the reporting activities of the separate reporting organizations (if more than one) to eliminate duplication in the reporting of space, personnel and funds.
- e. Submit the original of each Part B survey response to HRF Survey, Health Research Facilities Branch, Division of Research Facilities and Resources, National Institutes of Health, Bethesda, Maryland 20014.

1. Overall Coordinator

Person responsible for overall coordination of institution's survey response(s):

Name _____ Title _____

Address _____
(Street)

(City) (State) (Zip)

Telephone Number (include area code) _____

DUE DATES: PART A consists of preliminary information and is to be completed and returned not later than September 18, 1968.

Each PART B should be returned not later than October 18, 1968.

If additional Part B forms are needed, or if clarification is required, please contact:

James M. Daley (301) 657-9170 - Washington, D. C.

or

Donald T. Searls (303) 238-0332 - Denver, Colorado

2. Type and ownership of institution (Check one box only)

Type of Institution	Public			Private Nonprofit
	State	County	City	
a. Educational Institution (Go to item 3)				
b. Independent Hospital* (Go to item 4)				
c. Nonacademic Research Institution** (Go to item 5)				
d. Public Department of Health, or Mental Health, or State Board, etc. (Go to item 6)				
e. Other (Specify) (Go to item 7)				

Notes: * Independent Hospital is one not owned by a medical school, a university, or a state or local department of health, although affiliation with a medical school or university may exist. Public hospitals (e.g., built by a hospital district) not owned by a department or board of health are to be classified as independent hospitals.

** Nonacademic Research Institution is a public or private, nonprofit, independent institution which is not an independent hospital or a part of a college or university.

3. Educational Institutions ONLY

Separate Part B survey responses are requested from each organizational component listed below. Please name the person responsible for submission of each Part B response. The number of persons named will be the number of responses to be submitted by your institution.

Organizational Unit (or nearest equivalent)	Name, title and address of persons responsible for preparation of Part B survey response(s)
a. Dental School	Name _____ Title _____ Address _____ _____ Zip _____ Telephone Number (include area code) _____
b. Medical School (include data on medical school hospital in medical school response)	Name _____ Title _____ Address _____ _____ Zip _____ Telephone Number (include area code) _____
c. School of Pharmacy	Name _____ Title _____ Address _____ _____ Zip _____ Telephone Number (include area code) _____
d. School of Public Health	Name _____ Title _____ Address _____ _____ Zip _____ Telephone Number (include area code) _____

3. Educational Institutions (continued)

Organizational Unit (or nearest equivalent)	Name, title and address of persons responsible for preparation of Part B survey response(s)
e. School of Veterinary Medicine	Name _____ Title _____ Address _____ _____ Zip _____ Telephone Number (include area code) _____
f. All other Colleges, Schools, Institutes, Laboratories, etc., of the educational institution (one aggregate Part B response)	Name _____ Title _____ Address _____ _____ Zip _____ Telephone Number (include area code) _____

Please also list below the names and addresses of hospitals affiliated with the medical school in which health-related research is conducted by faculty of the medical school:

Do not list hospitals owned by the medical school.

Names of Hospitals Affiliated with the Medical School	City and State
g.	
h.	
i.	
j.	
k.	

This completes Part A for educational institutions.

4. Independent Hospitals ONLY

One Part B survey response is to be submitted by the coordinator named in item 1 above.
Please also list below the educational institutions, if any, which have faculty who
conduct health-related research in your hospital:

Names of Educational Institutions	City and State
a.	
b.	

4. Independent Hospitals (continued)

Names of Educational Institutions	City and State
c.	
d.	
e.	

This completes Part A for independent hospitals.

5. Nonacademic Research Institutions ONLY

One Part B survey response is to be submitted by the coordinator named in item 1, above.

This completes Part A for nonacademic research institutions.

6. Public Department of Health, or Mental Health, or State Board, etc. ONLY

One Part B survey response is to be submitted for each institutional component (e.g., hospital or research laboratory) in which at least 5,000 net square feet of space are devoted to health-related research. One aggregate Part B response is to be submitted for ALL OTHER institutional components. The coordinator named in item 1 is to coordinate and submit all responses. Please list below the organizational components for which separate Part B responses will be submitted:

Names of Major Organizational Components for which
separate Part B responses will be submitted (Please attach additional sheet if necessary)

Name of Organizational Component	Name, title and address of persons responsible for preparation of Part B survey response(s)
a.	Name _____ Title _____ Address _____ _____ Zip Telephone Number (include area code) _____
b.	Name _____ Title _____ Address _____ _____ Zip Telephone Number (include area code) _____
c.	Name _____ Title _____ Address _____ _____ Zip Telephone Number (include area code) _____

This completes Part A for public departments of health, or mental health, or state boards, etc.

7. Other Institutions

One Part B survey response is to be submitted by the coordinator named in item 1, above.

This completes Part A.

Department of Health, Education, and Welfare
Public Health Service
National Institutes of Health
Health Research Facilities Branch
**SURVEY OF HEALTH-RELATED RESEARCH
FACILITIES IN THE NONPROFIT SECTOR**

September 1968

Do not write in this space

PART B

See purpose and scope of survey, page 12, and instructions and definitions beginning on page 2.

SECTION II - IDENTIFICATION OF RESPONDENT

8. Respondent institution or institutional component _____

9. Address _____
(Street)

(City)

(State)

(Zip)

If the respondent named above is a reporting component of the parent institution, please complete items 10 and 11. Otherwise proceed to item 12.

10. Parent institution_____

11. Address _____
(Street)

(City)

(State)

(Zip)

12. Kind of respondent institution named under item 8, above, or nearest equivalent (please check one). (See General Instructions on page 2.)

Educational Institution

- Dental School
- Medical School, including any hospitals owned by the medical school or the university
- School of Pharmacy
- School of Public Health
- School of Veterinary Medicine
- Aggregate report by parent institution for all components not covered above

Nonacademic Institution

- Independent Hospital
- Nonacademic Research Institution
- Public Department of Health, or Mental Health, or State Board, etc., or a component thereof
- Other (specify) _____

13. Name, title and telephone number of person directing preparation of this Part B response:

(Name)

(Title)

(Telephone - Include Area Code)

For clarification of questions pertaining to this survey, please contact:

James M. Daley (301) 657-9170 - Washington, D. C.

or

Donald T. Searls (303) 238-0332 - Denver, Colorado

DUE DATE: Please submit this Part B survey response not later than October 18, 1968 to HRF Survey, Health Research Facilities Branch, Division of Research Facilities and Resources, National Institutes of Health, Bethesda, Maryland 20014.

GENERAL INSTRUCTIONS

The questionnaire is in two parts. Part A (blue form), to be completed by the central administration, covers 7 items and describes the institution's organizational structure, names a coordinator for the survey, and lists each person who will complete a Part B (white form). Separate Part B responses, covering items 8 through 35, are to be prepared as indicated below:

<u>Kind of Institution</u>	<u>Responses Requested</u>
<u>Educational Institutions</u>	One Part A from the central university administration; one Part B for each dental school, medical school, school of pharmacy, school of public health, school of veterinary medicine; and one aggregate Part B response for all other schools, colleges, institutes, laboratories, etc.
<u>Nonacademic Institutions</u>	<p>a. Independent hospital b. Nonacademic research institution c. State, County or City Department of Health or Mental Health or State Board d. Other institutions</p> <p>One Part A and one Part B. One Part A and one Part B. One Part A for <u>each</u> such department; one Part B for each institutional component (e.g., hospital or research laboratory) in which at least 5,000 net square feet of space are devoted to health-related research; and one Part B for the aggregate of all other components of the department. One Part A and one Part B.</p>

DEFINITIONS

1. HEALTH-RELATED (H-R) RESEARCH comprises a broad area of scientific inquiry aimed ultimately at the improvement of human health and the conquest of disease. It draws upon all fields of science — life, physical, engineering, psychological, and social — and many disciplines within each field. Within this broader context Health-Related Research is defined as all systematic study directed toward the development and use of scientific knowledge through fundamental research in the laboratory, clinical investigations, clinical trials, epidemiological, engineering, and demographic studies, and controlled pilot projects in the following areas:

- a. The causes, diagnoses, treatment, control, prevention of, and rehabilitation relating to the physical and mental diseases and other killing and crippling impairments of mankind;
- b. The origin, nature, and solution of health problems not identifiable in terms of disease entities;
- c. Broad fields of science where the research is undertaken to obtain an understanding of processes affecting disease and human well-being;
- d. Research in nutritional and population problems impairing, contributing to, or otherwise affecting optimum health;
- e. Development of improved methods, techniques, and equipment for research, diagnoses, therapy, rehabilitation, the delivery of health services, and the promotion of public health.

As a further general guideline, respondents should include as health-related any research or research training which is or could be supported by the Public Health Service.

2. HEALTH-RELATED (H-R) RESEARCH SPACE is that space in which H-R research or research training is being conducted. (Do not include classrooms.) Space for supporting activities should be included, according to the following guidelines:

- a. Research operations space, including space for fixed and movable equipment, laboratory working space, current supply storage, office and conference space.
- b. Controlled environment space, including controlled temperature rooms, clean or white rooms, metabolic chambers, and cryogenic facilities.
- c. Technical support space, including electronic, instrument, carpenter and machine shops, media preparation, glassware washing, photographic and medical arts, computer and information storage, reading and reference rooms (but not libraries), distilled or ionized water supply and special waste-handling systems.
- d. Research animal facilities, including animal production colonies, animal holding rooms, rack- and cage-washing and storage, animal food and bedding, animal surgery, and isolation and germ-free rooms.
- e. Research administration space, including offices, conference rooms, record rooms and computer rooms.

3. NET SQUARE FEET (nsf) of health-related research space is the interior floor space utilized for health-related research as described in 1 and 2, above. The total net area should be computed by measuring from the inside finish of permanent outer building walls to the office side of corridors and to permanent partitions. Do not include as H-R research space: space for corridors, stairways, elevators, mechanical equipment, utility distribution, permanent partitions, lobbies, toilets, lounges.

The term "net square feet" is synonymous with "net assignable square feet" used by the Office of Education for facility classification and inventory procedures.

4. OWNERSHIP OF H-R RESEARCH SPACE. For purposes of this survey, H-R research space shall be classified as either rented or owned. Report space as rented if it is leased or rented on the commercial market by the respondent institution or component thereof. Report all other space as owned by the respondent or component thereof (or by another institution such as an affiliated hospital). Duplicate reporting of the same space by two or more components of an institution should be avoided. Guidelines for reporting H-R research space owned by a parent academic institution are listed below:

- a. If the dental school and medical school occupy entirely separate buildings, each will report the amount of H-R research space under its control as "owned" space.
- b. If the dental school occupies a wing, or other specific area, in the medical school building, the dental school will report as "owned" the H-R research space in its wing (or other specific area), and the medical school will report the space under its control as "owned", excluding the dental school space.
- c. If the dental school and medical school use laboratories in the biology building for H-R research, the component in charge of the biology building will report all the H-R research space in the building as "owned" and the other schools will not.
- d. H-R research facilities under central control, such as animal housing or computer facilities, should be reported as "owned" by the central administration of the institution.

5. USE OF H-R RESEARCH SPACE by the respondent implies that H-R research is being conducted in the space under the scientific supervision of the respondent. Space may be MULTI-PURPOSE, that is, JOINTLY USED WITH OTHER ACTIVITIES (such as teaching or patient care) in which case an allocation of the space is required. If it is possible to separate the area into that part in which H-R research is undertaken exclusively (or essentially so) and that part in which other activities are undertaken exclusively, the allocation is to be determined in that manner. However, where H-R research and other activities are undertaken in the same space, the nsf of H-R research space may be allocated on the basis of:

- a. Percentage of units used for H-R research (e.g., proportion of animals); or
- b. Percentage of time available for H-R research.

H-R research space that is SHARED with other institutions, or reporting components within the same institution, will also require an allocation of space between the users of the space. Consider an independent hospital with a total of 100,000 nsf of space in part of which two medical schools conduct H-R research. The portion of the 100,000 nsf allocable to H-R research must first be determined, using the above procedures referring to joint use of space. The research portion must be further allocated among the two medical schools and the hospital. That allocation can be made as indicated above on the basis of area, units, or time.

Where shared use is involved, respondents (e.g., the two medical schools and the hospital in the example above) are urged to coordinate their responses in order to insure:
(1) coverage of all H-R research space, and (2) avoidance of duplicate reporting.

SPECIFIC INSTRUCTIONS

- Item 14 AGE OF CONSTRUCTION as classified in the column headings refers to the age at which the space (now being used for H-R research) was originally built rather than to a later time when the space may have been remodeled. Age of construction can be considered the date of original occupancy. For example, a building may have been built in 1939 and a wing added in 1961 in which case the space in the original building is to be reported in column (a) and the space in the new wing in column (c).
- a. Report the net square feet (nsf) of health-related research space by the age of the original construction as specified by column headings.
 - b. The typical case to be reported is that in which the respondent is a hospital affiliated with (but not owned by) a medical school. The hospital reports the amount of space owned by it but used for H-R research by the medical school.
 - d. Report space obtained on the commercial market only. Do not report space utilized in another health-related institution such as an affiliated hospital.
 - e. The typical case to be reported is that in which the respondent, such as a medical school, is a user of space owned by an affiliated hospital. Space owned by a medical school, but used by, say, a dental school will be reported here by the dental school (see definition 4b).
- Item 15 Space should be reported in SATISFACTORY condition if it is physically sound and substantially suitable to the H-R research currently under way, even though it might be overcrowded. Space SHOULD BE REMODELED if it is structurally sound but needs modification or reconditioning, or changes in lighting, electrical power, safety features, or central heating, air conditioning or ventilation to conduct the research currently under way. Space SHOULD BE REPLACED if it is structurally unsound or if its condition is such that it would be clearly advisable to replace it rather than to remodel it, to make it satisfactory for the research currently under way.
- Item 16 Space is to be reported as built with the assistance of the Health Research Facilities Construction Program if any part of the funds for building the space came from a grant from the Health Research Facilities Program of the National Institutes of Health.

SECTION III - HEALTH-RELATED RESEARCH SPACE CURRENTLY IN USE

ITEM	Number of net square feet of health-related research space allocated by periods of original construction.			
	Construction completed prior to Jan. 1940 (a)	Construction completed Jan. 1940 to Jan. 1957 (b)	Construction completed Jan. 1957 to present (c)	Total (d)
14. Total net square feet (nsf) of health-related (H-R) research space currently in use:				
a. Owned and used by personnel of the respondent institution or reporting component thereof.				
b. Owned by respondent but used by personnel whose primary appointment is on the staff of another institution or reporting component thereof. Item 14b col. (d) should agree with item 24e.				
c. Total owned H-R research space (items 14a and b).				
d. Rented by respondent for own use.				
e. Owned by another institution or reporting component thereof, but used by personnel of respondent. (Total should agree with item 23i col. (b).)				
f. Total (items 14c, d, and e).				
15. Condition of owned space reported on line 14c:				
a. Satisfactory				
b. Should be remodeled				
c. Should be replaced				
d. Total (must agree with item 14c).				
16. Net square feet of NEW space constructed since Jan. 1957 (item 14c col. (c)) which was built with the assistance of the Health Research Facilities construction program.				

- Item 17 a. Remodeling includes (but is not limited to) modification, reconditioning, and changes in heating, lighting, electrical power, air conditioning, ventilation or safety features.
- b. Space is to be reported as remodeled with the assistance of the Health Research Facilities Construction Program if any part of the funds for remodeling the space came from a grant from the Health Research Facilities Program of the National Institutes of Health.
- Item 18 a. Report that portion of the space devoted to care and housing of animals for H-R research.
- b. See instructions for items 16 and 17b.
- Item 19 Assume that the research space reported on lines 14a, d and e is in satisfactory condition for the research being undertaken. How much additional space is needed to relieve overcrowding of the present H-R research staff?
- Item 20 The respondent's BEST JUDGMENT is solicited. (See instruction for item 17a.)
- Item 21 Sponsored H-R research consists of specific research projects financed by governmental agencies, other outside organizations or individuals by contracts, grants or other written agreements.
- Other separately budgeted H-R research consists of specific research projects which are not financed in the manner described for sponsored research; e.g., research projects financed through the regular operating budget of the institution. Include indirect cost in reported expenditures.
- Item 22 The number of personnel engaged in H-R research should correspond to the number employed in a typical work week during the current year. It is recognized that the categories may not be those by which employees are classified in your records; however, they represent a uniform classification system which will yield aggregates most useful for the purposes of this survey.
- a. Professional staff - Includes principal investigators, (i.e., project leaders), and other personnel whose function in the research project is to carry the research forward on a professional level. These persons will have already completed their formal research training, and function now as research collaborators and assistants. They usually (although not necessarily) will already hold the doctoral degree. Do not include in this category persons holding postdoctoral research fellowships (either as recipients of direct fellowships or as participants in a postdoctoral training grant covering more than one trainee) unless they are functioning as principal investigators.
- b. Postdoctoral research fellows and trainees - Report all persons engaged in health-related research who hold direct postdoctoral fellowships, or who participate in a postdoctoral training grant program. These persons may be functioning at a professional research level (but not as principal investigators), or may be assigned to the research project for training purposes, or may be utilized as technicians or helpers.
- c. Graduate students - Report all graduate students engaged in health-related research, irrespective of whether the graduate student is working as a research assistant, as research trainee, technician or helper.
- d. All others - Report all persons performing sub-professional functions such as technicians, secretarial and clerical staff, animal handlers, helpers, etc., employed in the H-R research space reported on lines 14a, d, and e.

ITEM	Number of net square feet of health-related research space
17. a. Net square feet of space reported on line 14c, col. (d) which has been REMODELED since January 1957	
b. Net square feet of space reported on line 17a which was REMODELED with the assistance of the Health Research Facilities construction program	
18. a. Net square feet of space reported on lines 14c and d, col.(d)used for care and housing of animals for H-R research	
b. Net square feet of space reported on line 18a which was built or remodeled with the assistance of the Health Research Facilities construction program	
19. How many nsf of H-R research space, in addition to the space reported on lines 14a, d and e, are needed to relieve overcrowding of present H-R research staff reported on line 22e?	
20. What is your best judgment as to the percentage of H-R research space that needs to be remodeled per year, on the average, in order to maintain its effectiveness?	<u>PERCENT</u> %

**SECTION IV - ANNUAL EXPENDITURES FOR SPONSORED AND OTHER
SEPARATELY BUDGETED H-R RESEARCH**

ITEM	Cost
21. Report the annual expenditures for sponsored and other separately budgeted H-R research and research training:	
a. Sponsored H-R research projects	\$ _____
b. Other separately budgeted H-R research projects	\$ _____
c. Total	\$ _____
d. 12-Month period covered: From _____ To _____	

- Item 23 A listing is desired on lines 23a to h, col. (a), of all institutions (e.g., affiliated hospitals) which provide H-R research space to the respondent. Itemize that space in col. (b). A health-professional school within a university should be listed as an affiliate of the respondent if that school owns space which is used by the respondent for H-R research (see definitions 4 and 5). Rented commercial space is not to be reported in this item. The respondent shall report in col. (c) the number of full-time and part-time professional staff reported on line 22a who are engaged full-time or part-time in H-R research in buildings owned by other institutions (or reporting components within the respondent's institution). Medical schools are urged to coordinate their responses with their affiliated hospitals to insure coverage of all H-R research space and to avoid duplicate counting of personnel. Medical schools shall report H-R research space they use in Federal hospitals (e.g., Veterans Administration or PHS hospitals) even though the Federal hospitals are not being requested to complete the survey forms.
- Item 24 A listing is desired on lines 24a to d, col. (a), of institutions which use health-related research space owned by the respondent. Report the H-R research space in col. (b). A health-professional school within a university which uses H-R research space owned by the respondent should be listed here (see definitions 4 and 5). Respondents are urged to coordinate their responses with affiliated schools and institutions.
- Items 25, 26 Report space under construction (or remodeling), space completed but not yet occupied, or space for which all funds have been obtained but for which a contract has not yet been let.
Report new construction in item 25 and remodeling in item 26. See instructions for items 16 and 17b when completing items 25b and 26b.
- Item 27 Report cost of construction (or remodeling) including site development, architectural/engineering services and built-in fixed equipment, but excluding land and movable equipment.
- Item 28 The institution's unrestricted funds may include unrestricted endowments, operating funds, or other unrestricted appropriations or gifts. Funds from state and local governments are those appropriated specifically for construction or remodeling. It is important to note that the sources of funds refer only to those for H-R research space, not to those for the total construction project in the case of multi-purpose projects.
- Item 30 This item is optional. If the institution has fairly complete plans concerning future space requirements, a summary of principal uses would be appreciated.
- Item 32 Report estimated cost of construction (or remodeling) including site development, architectural/engineering services and built-in fixed equipment, but excluding land and movable equipment.
- Item 35 General comments on any aspect of the Health Research Facilities program and its administration are invited.

SECTION V - PERSONNEL CURRENTLY ENGAGED IN H-R RESEARCH

ITEM	Number of Full-Time Employees (a)	Number of Part-Time Employees (b)
22. Total number of full-time and part-time personnel of the reporting institution devoting at least part of their time to H-R research in the space reported on lines 14a, d, and e:		
a. Professional staff		
b. Postdoctoral research fellows and trainees		
c. Graduate students		
d. All others (technicians, helpers, secretaries, animal handlers, etc.)		
e. Total		

SECTION VI - HEALTH-RELATED RESEARCH SPACE OWNED BY OTHER INSTITUTIONS

BUT USED BY RESPONDENT

ITEM (a)	Nsf of H-R research space owned by other institutions but used by respondent (b)	Number of respondent's full-time and part-time professional staff who conduct research in the space in col. (b) (c)
23. This item is to be completed ONLY by respondents (e.g., medical schools) whose professional staff use H-R research space in buildings owned by other institutions (e.g., affiliated hospitals). List below the institutions (e.g., affiliated hospitals) which own space used by the respondent's staff for H-R research:		(Include staff holding joint appointments if their primary affiliation, as evidenced by salary source, is with the respondent institution.)
a. _____		
b. _____		
c. _____		
d. _____		
e. _____		
f. _____		
g. _____		
h. _____		
i. Totals (col. (b) must agree with item 14e)		

**SECTION VII - H-R RESEARCH SPACE OWNED BY RESPONDENT
BUT USED BY OTHER INSTITUTIONS**

ITEM (a)	Nsf of H-R Research Space Used by Other Institutions (b)
<p>24. This item is to be completed ONLY by respondents (e.g., affiliated hospitals) who own H-R research space which is used by professional staff of other institutions (e.g., medical schools).</p> <p>List below the institutions (e.g., medical schools) which use respondent's H-R research space:</p> <p>a. _____</p> <p>b. _____</p> <p>c. _____</p> <p>d. _____</p> <p>e. Totals (Must agree with item 14b)</p>	

SECTION VIII - H-R RESEARCH SPACE UNDER CONSTRUCTION OR FULLY FUNDED

ITEM	Net Square Feet
25. a. NEW H-R research space under construction or for which construction is fully funded	
b. Net square feet reported on line 25a being built or to be built with the assistance of the Health Research Facilities construction program	
c. Net square feet reported on line 25a for the care and housing of animals for H-R research	
26. a. H-R research space being REMODELED or for which remodeling is fully funded	
b. Net square feet reported on line 26a being remodeled or to be remodeled with the assistance of the Health Research Facilities construction program	
c. Net square feet reported on line 26a for the care and housing of animals for H-R research	
ITEM	Cost
27. Cost of construction or remodeling under way or fully funded:	
a. New construction of H-R research space (item 25a)	\$ _____
b. Remodeling of H-R research space (item 26a)	\$ _____
ITEM	PERCENT
28. For the total H-R research construction and remodeling under way or fully funded (item 27), indicate the percent of funds which come from each of the following sources:	
a. Institution's unrestricted funds	_____%
b. Institutional borrowing	_____%
c. Private funds restricted for construction and remodeling	_____%
d. Construction funds from state and local governments	_____%
e. Health Research Facilities construction grants	_____%
f. Other Federal	_____%
g. Other	_____%
h. Total	100%

SECTION IX - FUTURE H-R RESEARCH SPACE REQUIREMENTS AND PLANS

ITEM	Net Square Feet	
	New Construction (a)	Remodeling (b)
29. How much new construction and remodeling in addition to that shown on lines 25a and 26a are needed to meet projected H-R research space requirements in 1980?		
Those institutions that have sufficiently detailed plans of future construction or remodeling are also requested to respond to item 30.		
30. Planned use of construction and remodeling reported in item 29:		
a. To provide additional space for expanding existing H-R research programs		
b. To provide additional space for new H-R research programs		
c. Other (specify): 1. _____ 2. _____ 3. _____		
d. Total (must agree with item 29)		
31. How much of the additional space reported on line 29 is projected for the care and housing of animals for H-R research?		
32. Estimated cost of construction and remodeling of H-R research space reported on line 29 at 1968 prices.	Cost	\$
33. How much of the cost reported on line 32 do you estimate can be met from non-Federal sources?	\$	\$
34. What institutional programs would be most seriously affected if the additional construction and remodeling reported on line 29 were not done? _____ _____		
35. General comments: _____ _____		

PURPOSE AND SCOPE OF SURVEY

As the principal agency of the Federal Government sponsoring biomedical research, the National Institutes of Health is concerned with the adequacy -- both in quality and quantity -- of the Nation's physical facilities for the conduct of research in the sciences related to health. During the past 12 years the National Institutes of Health has awarded about \$500 million in matching grants to over 400 institutions for construction or remodeling of health research facilities. To plan soundly to meet the future needs of the biomedical research community, the National Institutes of Health has contracted with Westat Research, Inc. of Bethesda, Md. to conduct a national survey of health research facilities in the public and private institutions of higher education, hospitals, research institutions, and public departments of health and mental health. The survey will obtain information on the amount of space presently in use for research in the sciences related to health, the amount under construction or fully funded, and the additional construction and remodeling required over the 12-year period, 1968-1980. The survey also will determine the condition of the existing space, the cost of research, and the personnel utilizing the space.

The results of the survey will enable the National Institutes of Health to improve its ability to plan and administer the future of that program so as to respond to the needs of the biomedical research community.

Please be assured that the data you provide will be treated as professionally privileged. Reports prepared from the survey will not reveal the specific data of any single facility or organization; rather, analyses, results and conclusions will deal only with aggregate data. A copy of the final report will be mailed to each organization responding.

QUESTIONNAIRE ORGANIZATION

PART A (BLUE FORM)

Section I - Preliminary Report

PART B (WHITE FORM)

Section II - Identification of Respondent

Section III - Health-Related Research Space Currently In Use

Section IV - Annual Expenditures For Sponsored and Other Separately Budgeted H-R Research

Section V - Personnel Currently Engaged in H-R Research

Section VI - Health-Related Research Space Owned By Other Institutions But Used By Respondent

Section VII - H-R Research Space Owned By Respondent But Used By Other Institutions

Section VIII - H-R Research Space Under Construction or Fully Funded

Section IX - Future H-R Research Space Requirements and Plans





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